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PROCEEDINGS, SIXTH ANNUAL MEETING, AMERICAN GAS INSTITUTE.

HELD IN ST. LOUIS, MO., OCTOBER 18 TO 20, 1911.

FIRST DAY—MORNING SESSION.

The Sixth Annual Meeting of the American Gas Institute was held in St. Louis, Mo., in the hall of the Art Museum. The opening session (Wednesday morning, Oct. 18, 1911) was called to order by the President (Mr. Donald McDonald, of Louisville, Ky.), at 10:10. Mr. A. B. Beadle occupied the Secretary's desk. The President introduced Mayor Frederick Kreismann, who made this

ADDRESS OF WELCOME.

Mr. President and Gentlemen of the American Gas Institute: If the weather this morning has anything cheering in its sunlight, it is indicative of the pleasure that the people of St. Louis feel and the honor they recognize in your assembling in our city to hold your deliberations. Of the hearty welcome and the arrangements made for your entertainment, I am quite sure. Under the guidance of our fellow-citizens, and your associate, Mr. Holman, you will be quite pleased, for is was a great pleasure to him I am sure to be a factor in bringing you here.

The industry which you gentlemen represent is one which has kept pace with its rival electricity, which through invention, research and study on your part and a broad technical training of the men engaged in the gas business, has made it a utility not only as an illuminant, but as the most modern and economical fuel product, especially for a large community. The invention of the product of that master mind, Dr. Carl Auer von Welsbach, has enabled you to hold its illuminating properties in keeping with the demands made upon electricity. The gas industry is one of the public utilities that is in itself a monopoly product. The very nature of the business, running largely into the commercial side, makes it necessarily a monopoly utility, if the greatest results in economy and the lessening of cost to consumers are the prime objects. The fallacy of competition in this business has been well worked out in the minds of the people, and it has been wise and prudent regulation of your business, and the very careful and diplomatic conduct of your relations to municipalities and to the public, that have caused this principle to become better understood. A cheap, ample and dependable supply of illuminant is one of the greatest civilizing factors in urban life. The police authorities sometime say that every street lamp is a good constable. Nothing adds more to the peace and order of a community than adequate illumination. The modern inventions and perfection of electricity, your great competitor, have caused you men to look to another field and another form of consumption, and that has brought you into the realm of domestic use for fuel. A wise forethought has caused you to call into your business activities the distribution, sale and encouragement of the use of your product by the installation of all kinds of modern appliances. These have brought convenience and comfort to every household, particularly to the households of the middle people. You have, therefore, many factors, and every home feels some betterment because of your activities.

In speaking of the gas business, I hope I may not burden you with something that my mind was drawn to last evening, because I realized that I ought to give some attention, some little thought, to what I might say to you here to-day in recognition of the importance of your business. I find that Europe (particularly Germany, England and Scotland) is serving the public by municipal corporations or municipal plants. America has not taken to that idea; and I think wisely. It has allowed that industry and that utility to be served and furnished by private corporations, and in late years there has been a working to a much better understanding between the public and these private corporations, whereby the capital invested in your plants is to be better safeguarded and the product disposed of at a reasonable cost to the consumer with fair profit to the capital invested. Paris, I understand, is still served by a private corporation. Up to the year 1850 Paris was served by some 7 or 8 individual or separate plants, each having its district and each being under the control or supervision of the authorities. In 1855 6 of these plants were consolidated, resulting in a better service, in a more economical administration of the several plants and the lessening of the cost to the consumer. In 1861 all of the plants were merged into one large unit of service. And what has been the result? This authority states that the city, as a consumer in the lighting of its streets and public buildings, so far as gas is still used as an illuminant, is served at approximately the cost of production, and to-day the revenue to the city of Paris, as a consideration for the street rentals and the privileges of serving the public is over 20 million francs a year. These are the ends that I believe will be reached in our large American cities, and I trust your deliberations and the influence of this Institute may push that end further into sight.

Mr. President, it has always been customary, as you anticipated, that you would receive to-day the keys of the city. It has been my pleasure to extend and to offer the keys of the city to many of our distinguished associations and business organizations that do us the honor to assemble in St. Louis, and it is a custom that is dealt in largely from a figurative standpoint; but in evidence of the fact that

we have keys here, which fit all locks, I have taken the opportunity to present a real key to you. (Presenting a large key to the President). I am glad, gentlemen, that you are with us.

The President said he felt certain the Institute wanted to congratulate the city of St. Louis on having such a level-headed Mayor, one who was so kindly actuated towards the gas industry and one who evidently knew so much about the business. He then called upon Mr. E. G. Pratt to respond on behalf of the Institute.

MR. PRATT'S RESPONSE.

Mr. Pratt—Mr. President, Mr. Mayor and Gentlemen: I have just entered the room, and to be called upon thus suddenly to respond to such an enthusiastic welcome as has been extended to us is something a little beyond me; and yet, knowing the circumstances, I shall not shrink from the performance of a duty which, with the opportunity of making some preparation, would have given me a great pleasure. I know I can say for the gentlemen here assembled that we appreciate, Mr. Mayor, your presence this morning. We appreciate your words of welcome and also the spirit which prompted their delivery. We accept the key to the city, but in so far as the necessity of its use is concerned, I think we all agree that, from past experience, no key is necessary, for the gates of this hospitable city of St. Louis have, upon former occasions, been found open to us. Referring to matters concerning the meeting of this Institute and what it means to its members, our consumers and city officials sometimes imagine that we gather at intervals of once a year, or oftener, to devise ways and means of reducing the quality of our product and increasing its price; but I should like to have the Mayor of this city understand, if it is not already understood by him, and judging by his intelligent and courteous remarks, he does understand, that we come here chiefly for the purpose of discussing those things which are to benefit, not only our customers but ourselves as well. What benefits us benefits also the community whom we serve, and members of the Institute lay aside for a few days their duties at this time, for this purpose and for this purpose only; and if we could only impress upon the communities served and our consumers the thought that every effort is intended for their benefit and for their good, and to make it so understood, I believe the corporations to which the Mayor has referred would be looked upon in an entirely different aspect. It is not my purpose or intention to do more than to thank the Mayor on your behalf for coming here this morning. As I have already said, we appreciate it. We know what the hospitality of the city of St. Louis is, as we have experienced it many times before this; and while we shall make the most of it, I think I can safely say for these gentlemen, we will not abuse it. I thank you.

The reading of the minutes of the last meeting having been ordered dispensed with, the President in

WELCOMING NEW MEMBERS,

said: Next on the official programme is the welcoming of new members. I want all of them to know that they are welcome. I want them to feel free to take every opportunity that offers to take part in our proceedings. We are glad to have them. I will not put them through the awkward squad exercise of rising to their feet to be looked at, but I want them to know that, whatever they have to say, we shall be glad to hear, and if they belong to this body without the membership knowing that they are in it it will be entirely their own fault, because we shall always be glad to hear from them.

The Secretary then read the

REPORT OF THE BOARD OF DIRECTORS,

which was a voluminous document, It contained a record of the various meetings, with the detail of the work accomplished. Amongst other things, there were prominent: The "Bulletin of Abstracts" was continued; that during the year the rolls were increased by the placing thereon of 128 names thus classed: Active, 80; associate, 24; junior, 24. During the year 93 had been dropped, of whom 15 had joined the great majority. The total on rolls, to September 1st, was 1,383; "Proceedings" in stock numbered 368; and 74 badges were in stock. The Treasurer's report showed a total receipt of $15,184.91, an expenditure of $12,643.21, and a total to surplus of $6,857.99. Outstanding accounts represented $3,075. The accounting sheets bore the attestation of the Auditing Committee. It was also recommended that Mr. A. B. Slater be named to Life Membership, in recognition of his presentation to the Institute of his valuable collection of books, papers and pamphlets. It was also recommended that the Institute contribute the sum of $350 to the Gas Educational Fund. The following

GENERAL RECOMMENDATIONS

were submitted:

1. That the number of papers to be presented and discussed at future annual meetings be limited to 10.

2. That a committee be appointed to consider and report on the standardization of gas works apparatus; such as works' fittings, valves with uniform width across the flanges and standard tests of same; manholes and handholes; covering uniform design as to general dimensions, thickness of flanges, bolt holes, etc., etc.; also another committee to consider and report on allowed strains in the designs of gasholders and to purchase standard specifications covering tensile strength, elastic limit bending tests of light steel plates and sheets, structural steel, rivets, etc., and minimum thickness of plates.

3. That the Editor of the Wrinkle Department for the coming year be requested not to solicit new wrinkles, but to examine and edit all the wrinkles that have been presented to the Institute and its preceding associations. And that he classify and index them, after rejecting those that have been found impractical or obsolete.

4. That a committee be appointed to consider and report on the development of a small unit gas engine.

5. That it is the sense of the Directors that the Institute should publish and distribute to the members at intervals during the year a Bulletin that will acquaint the members with the general affairs of the Institute, and embody any specific information which may be of interest to the members.

6. That the Secretary be instructed to ascertain the present status of all the State and district gas associations in the United States, and report on the prospect of inducing those not already affiliated, to become affiliated with the Institute.

On motion, the report was ordered received and filed, and that the Institute concur in the recommendations made by the Directors.

At this point Vice-President W. C. Morris was called to the chair and President McDonald read the

INAUGURAL ADDRESS.

[For the text of the Address, see *ante*, p. 274, Oct. 30.]

(To be Continued.)

ACTUAL LEAKAGE IN UNACCOUNTED-FOR GAS.

[Prepared by MR. JACOB D. VON MAUR, for the Sixth Meeting, American Gas Institute.—Concluded from page 366.]

Electrolysis.—One of the most prolific causes of actual leakage is that due to electrolysis. Much has been written of the subject, and many theories have been advanced, but after one has read and listened to them all he is as much in the dark as ever as to just what practical steps he should take to prevent damage which is constantly going on in the particular system over which he has charge.

The writer, while having no theories to advance, feels that, if the following rules are intelligently followed, the leakage from mains and services, due to corrosion and electrolysis, as well as from other causes, will be materially lessened, although the final solution for the prevention of electrolysis must be found by finding a way by which the railway company must utilize its own property for the return of its currents to the power house instead of that furnished by the pipes of the conduit companies. Possibly we will yet see the day when street cars will be moved under a system which will not require the use of wires or rails to carry the current, the energy being supplied by some high efficiency storage batteries, but in the meantime we have to suffer and pay the bills. The respective managements of the conduit and railway companies should get together. The damage cannot be corrected by simply reading or writing papers, but much can be done by the responsible heads of the various companies meeting together and working under some definite plans, and utilizing the information and data furnished by those papers, etc.

One thing is certain, namely, that nothing thus far has been developed which can be installed at reasonable expense by the gas company that can prevent the tremendous damage which is constantly taking place in the destruction of our gas mains and services.

Some General Rules for Street Work.—The following rules refer particularly to large cities, and are intended to lessen the amount of unaccounted-for gas due to actual leakage. Many of the rules are based on what has already been said in this paper:

1. Lay no pipe smaller than 6 inches, except in special cases. This will make the bulk of the main system of 6-inch and 8-inch pipes; all mains to be used to be of cast iron, and at least as heavy as the standard used by the Philadelphia Gas Company.

2. Use cement joints entirely for all sizes of low pressure mains up to 30 inches, inclusive. There may be circumstances where this rule will have to be modified. For high pressure mains, 16 inches to 24 inches, inclusive, cement will probably give at least as good results as lead, but these mains must be laid with unusual care. Leaks will probably develop within a year after the main is laid, but after these have been once repaired there will be very little future trouble. It is admitted, however, that the making of joints on large high pressure mains is one of the most difficult problems with which we have to contend. It is advisable to use a leak clamp on each joint as an additional safeguard.

3. Use full weight, wrought iron or steel pipe, and a comparatively heavy beaded fitting for all service work, coating the pipe with at least 4 coverings of pitch and paper, as described, or some equally effective covering. The pipes should be left free from covering for a distance of 6 inches from each end, and this will assist in preventing the workmen from damaging the covering while using the wrench. When the service is completed this part of the pipe should be pitched and papered, in order to make it equally as efficient as the balance of the service. It is good practice to also coat the fittings with pitch, cement or asphalt at the point where the service joins the main. The coating described is tough and will stand hauling and fairly rough usage, but it cannot be abused, as, for instance, drawing it through the sharp teeth of the jaws of a vice, or dragging it out of the wagon over some metallic substance, such as the head of a bolt. Should one of these services subsequently be found eaten out by electrolysis the service should be renewed, using the same kind of pipe; but, in this instance, place the pipe inside of a tile pipe, after which the space between the tile and the service should be filled with pitch. The service fittings at the main should be thoroughly coated. The pitch and tile will absolutely prevent electrolysis and corrosion, although it is a very high first cost. It should be remembered, however, only that part of the service actually in the tile pipe will be protected. The fittings, lamp bends, etc., will still have to be specially treated.

4. All threads should be cut so as not to leave any part of the thread exposed outside of the fitting, as shown at the bottom of Fig. 2. Experience shows that both electrolysis and corrosion attack this part of the pipe more rapidly than at any other point.

The importance of this is best shown by examining the manifold referred to in this paper. We find the services eaten out at the thread, while the balance of the pipe is in good condition.

5. (a) Where there are street car tracks, a main should be laid near the curb on each side of the street, and in the opinion of the writer no other single thing will do more to avoid danger by electrolysis than this. But it must be admitted that to do this is to apply a very expensive remedy.

(b) Lay no main with less than 3 feet of cover, where the climate is similar to that of St. Louis.

(c) On very wide streets, such as boulevards, lay a main on each side of the street, close to the curb.

(d) On residential streets lay either 1 or 2 mains, depending on local conditions; but where one main is used it should be laid with a cover varying from 3 feet 6 inches to 4 feet 6 inches, depending on local conditions. It is a mistake to lay mains with excessive cover, for the reason that the cost of repairs is excessive, and also that leaks are likely to go on unnoticed.

(e) On streets where there are two car tracks, and on which it is desired to lay only one main, the main should be laid as near as practicable to the curb on one side of the street, and with such a cover as will keep the services crossing under the street car tracks a reasonable distance away from the tracks. Good judgment on streets of this character is particularly essential.

6. Lay no mains on ungraded streets unless an exact profile of the future grade of the street is available.

7. Where there is no curbing protect all stopboxes by means of small pieces of flagging placed around the box. Do whatever is possible to prevent water from reaching the service pipe outside of a service cock.

8. Under no circumstances lay a main or service on or through any solid structure, such as conduits, manholes, sewers, etc., and do not allow others to build these structures on or around mains or service pipes.

9. Lay no mains on filled-in ground until same is properly settled. Lay no service pipe or main in the same trench with other conduits.

10. Allow no electric bonding of any kind from any portion of the distribution system to street car tracks, or to other conduits.

11. In filling in trenches use no material for filling which may have a tendency to corrode the pipe, such as cinders, etc.

12. Stand for a little greater cost and lay every main and service as it should be laid, namely, on solid, undisturbed ground; and, in the case of the larger mains, use solid blocks countersunk, so that top of block is flush with surface of the ground,

13. To avoid mains breaking at the service, and services breaking at the main, see that the main is properly strengthened wherever the tap-hole may have a tendency to weaken the pipe. Ordinarily this is done by the use of cast iron, split service sleeves. These sleeves are expensive, and probably equally as good results can be obtained by using sleeves made of cement. These sleeves cost, in place, about one-sixth what cast iron sleeves cost. The forms are made of No. 20 galvanized iron, provided with a hook joint at the top, an opening being left through which the street tee is inserted. After the service pipe has been run the space between the pipe and the sleeve is filled with cement in exactly the same manner as is used in making up standard cement joints. These sleeves, of course, are used in connection with the small size mains only.

An experiment recently made by the writer, and tested under the direction os Prof. Van Ornum, of the Washington University, showed an adhesive strength of a good brand of Portland cement to cast iron, not specially prepared, of 25 pounds per square inch.

14. Finally, have every one in charge of the work fully alive to the fact that he is not building for the day only, but for many years to come. Provide a sufficient number of men to thoroughly inspect all work done, and provide these men with the necessary conveniences to enable them to see as much of the work as possible, thus properly supervising the work. Even when all of the above rules are rigidly followed, and additional ones equally good, perhaps better, that may be mentioned by others more capable than the writer in dealing with this problem, we will still have some leakage, but the amount will be confined to very much smaller limits than at present.

What can be expected is best shown by some tests of actual conditions. The following tests, shown in Tables 10, 11, 12, 13 and 14, were made by testing stretches of mains, together with the consumers' services and lamp services attached to them, after first making sure that the lamp cocks and the meter cocks along the route selected had been closed. The method employed in making the test is practically the same as that described on page 423, "Catechism of Central Station Gas Engineering of the United States," in answer to Question 227 of the Practical Class.

In selecting mains for test a number of mains were chosen at random. A second lot was selected with a view of getting the very worst conditions in the city. A third lot was selected as representing work done since 1903. Finally, a number were selected by disinterested parties. It is fair to assume that the final results show a true condition of the general distributing system. The tests were all carefully made and, where there was any doubt as to the bags holding, the mains were actually cut, thus isolating the main under test. About ⅓ the total were so made. All leakage was measured through a test meter. Any leakage through the consumers' meter cocks would, of course, show up as leakage.

Column 10 in the following table is calculated on the basis of considering all service pipe and all cast iron pipe 6 inches in diameter and under as 6-inch pipe, and reducing the larger sizes to equivalent 6-inch main.

Special Tests.—A number of special tests were made for specific purposes:

1.—6,400 feet of 24-inch high pressure main was isolated from the system, and tested with mercury gauge for 2 hours without showing any drop in pressure.

2.—7,480 feet of 24-inch high pressure and 4,050 feet of 12-inch high pressure line were isolated from the system for 4 hours.

The pressure in the test line was first raised to 5 pounds, and the pressure outside of the valves in the balance of the high pressure system was then lowered from 2¾ pounds to 1¾ pounds. Any leakage through the valves (3 in number) would then pass from the test line to the balance of the system, but no gas could leak past the valves into the pipes being tested.

The pressures were taken from long water tube gauges, and observation taken to nearest tenth of an inch. Knowing the volume of the pipe line tested and the drop in absolute pressure, the leakage was calculated. The pressure in the test line was then dropped to 34/10-inch water pressure and the outside pressure allowed to remain at 1¾ to 2 lbs. The amount of gas leaking through the valves into the

TABLE NO. 10.

Test No.	Size of Main, Ins.	Kind of Joint.	Length of Main, Feet.	No. of Services.	No. of Lamps.	Measured Leakage.	Rate Per Mile, Per Year.	Rate Per Mile on 3-inch Basis.	Rate Per Mile on 6-inch Basis, Inc. Services.	Cons. Per Lamp Per Hour.	Remarks.
1	3	Lead	969	51	4	5.000	238,710	238,710	64,200	3 cubic feet	Very old
2	3	.....	300	..	..	0.025	3,854	3,854	.....	.....	.....
3	3	Cement	300	5	..	....	.....	.....	.....	.....	.....
4	3	Lead	300	4	1	....	.....	.....	.....	.....	.....
5	3	Cement	110	4	..	6.000	2,530,000	2,530,000	893,500	.....	Very old
6	3	Lead	250	6	..	1.300	240,000	240,000	109.100	.....	.....
7	3	Lead	1,550	58	..	3.000	89,400	89,400	31,230	.....	.....
8	3	Lead	385	32	..	7.500	900,000	900,000	174,500	.....	.....
9	3	Lead	383	16	..	....	.....	.....	.....	.....	.....
10	3	Lead	387	16	..	1.200	143,500	143,500	43,000	.....	.....
11	3	Lead	380	8	..	4.000	486,000	486,000	237,000	.....	.....
12	3	Lead	610	30	..	20.000	1,520,000	1,520,000	438,500	.....	.....
13	3	Lead	600	..	..	....	.....	.....	.....	.....	.....
14	3	Lead	175	..	..	....	.....	.....	.....	.....	.....
15	3	Lead	300	15	..	3.75	578,160	578,160	161,060	.....	.....
16	3	Lead	294	3	1	....	.....	.....	.....	.....	.....
17	3	Lead	840	33	5	....	.....	.....	.....	.....	.....
18	3	Lead	295	15	..	....	.....	.....	.....	.....	.....
19	3	Lead	430	21	2	....	.....	.....	.....	.....	.....
20	3	Lead	516	22	..	0.40	35,828	35,828	11,145	.....	.....
21	3	Lead	352	12	..	0.40	52,560	52,560	19,000	.....	.....
22	3	Lead	290	8	..	....	.....	.....	.....	.....	.....
23	3	Lead	420	14	..	0.90	99,113	99,113	36,357	.....	.....
			10,426	373	13	53.475	237,000	237,000	81,886		

TABLE NO. 11.

Test No.	Size of Main. Inches.	Kind of Joint.	Length of Main. Inches.	No. of Services.	No. of Lamps.	Measured Leakage.	Rate per Mile Per Year.	Rate per Mile on 3-Inch Basis.	Rate per Mile on -Inch Basis, Inc. Services.	Cons. per Lamp. per Hour.	Remarks.
1	4	Cement	220	3	..	0.000	.....	.....	.....	...	.....
2	4	Cement	1,100	51	6	0.500	20,550	15,411	6,128	3.1	.....
3	4	Lead	920	36	5	2.300	115,500	86,960	37,800	2.6	.....
4	4	Cement	1,269	45	6	0.000	.....	.....	.....	...	.....
5	4	Cement	696	23	3	0.0	.....	.....	.....	3.0	.....
6	4	Cement	1,429	22	10	0.0	.....	.....	.....	3.0	.....
7	4	Lead	408	23	1	0.0	.....	.....	.....	3.0	.....
8	4	Cement	1,400	20	9	0.70	23,150	17,400	12,550	3.0	.....
9	4	Cement	1,550	10	8	0.30	8,950	6,715	6,265	3.0	.....
10	4	Lead	1,720	76	11	0.10	2,628	1,971	782	...	.....
11	4	Lead	400	11	3	0.00	.....	.....	.....	...	.....
12	4	Lead	512	14	2	4.00	360,500	270,100	147,800	3.0	.....
13	4	Lead	1,144	38	4	1.13	45,600	34,250	16,780	3.0	.....
14	4	Lead	1,144	39	4	0.380	15,350	11,500	5,540	3.09	.....
15	4	Lead	1,110	69	6	6.400	266,000	200,000	63,100	3.05	.....
16	4	Lead	385	11	2	0.500	60,000	45,000	23,700	3.1	.....
17	4	Lead	234	13	..	1.600	316,000	237,500	83,800	...	.....
18	4	Lead	500	11	7	0.0	.....	.....	.....	...	.....
19	4	Lead	784	15	4	0.0	.....	.....	.....	3.0	.....
20	4	Cement	609	30	4	0.0	.....	.....	.....	...	.....
21	4	Cement	1,120	51	5	0.40	16,470	12,395	4,900	3.0	.....
22	4	Cement	325	8	0	0.00	.....	.....	.....	...	.....
			18,979	619	100	18.310	44.570	33,500	1,634	2.98	Average

TABLE NO. 12.

Test No.	Size of Main. Inches.	Kind of Joint.	Length of Main.	No. of Services.	No. of Lamps.	Measured Leakage per Hour.	Rate per Mile per Year.	Rate per Mile on 3-Inch Basis.	Rate per Mile on 6-Inch Basis, Inc. Services.	Remarks.
1	6	Cement	3,662	160	20	2.5	31,550	15,775	10,440	Lamp 3′ per hour.
2	6	Lead	780	30	6	2.0	118,500	59,250	38,500	Lamp 3.6′ per hour.
3	6	Lead	860	56	5	0,9	48,450	24,225	11,060	Lamp 3.2′ per hour.
4	6	Lead	950	52	5	7.0	340,000	170,000	88,750	Lamp 3.1′ per hour.
5	6	Lead	1,140	36	4	0.64	25,900	12,950	9,800	Lamp 3.18′ per hour.
6	6	Lead	1,200	23	8	0.00	.....	.....	.....	3.0′ per hour.
7	6	Cement	924	0	0	0.00	.....	.....	.....	
8	6	Lead	950	41	6	5.00	243,500	121,750	74,040	Work done by contractor, 1903.
9	6	Lead	3,105	18	13	4.80	71,480	35,740	54,040	
10	6	Lead	1,854	57	7	12.00	299,000	149,500	114,500	Old-coated water pipe relaid, 1904.
11	6	Cement	1,650	80	9	0.00	.....	.....	.....	
12	6	Cement	1,854	73	4	1.00	24,990	12,495	8,300	Lamp = 3.04 per hour.
13	6	Lead	1,340	90	11	5.45	188,000	94,000	41,600	
14	6	L. & C.	600	1	3	0.00	.....	.....	.....	
15	6	L. & C.	8,500	35	16	0 00	.....	.....	.....	
16	6	Lead	850	26	2	0.50	27,230	13,615	10,540	
17	6	Cement	1,520	56	8	0.40	12,190	6,095	4,130	Lamps average 3.22 cu. ft. per hour.
18	6	Cement	500	0	0	0.0	.....	.....	.....	
			32,239	834	127	42.19	59,860	29,930	25,450	3.15

TABLE NO. 13.

1	8	Lead	2,500	60	14	0.00	.....	.....	.....
2	8	Lead	1,030	31	6	0.00	.....	.....	.....
			3,530	91	20	0.00	.....	.....	.....

TABLE NO. 14.

1	12	Cement	700	..	5	0.00	.....	.....	.....	This main lowered 2′ before testing.
2	12	Cement	600	1	6	0.00	.....	.....	.....	Laid, 1904.
3	12	Cement	3,900	27	28	....	.....	.....	.....	Laid, 1904.
4	12	Cement	1,520	92	7	0.00	.....	.....	.....	Lamp 3.14 cubic feet per hour.
(*Note.*—Calculations in above table made with slide rule.)			6,720	120	46	0.00	.....	.....	.....	

test line was then ascertained by calculation, as above. The results showed a leakage of 88.9 cubic feet per hour.

While this method is not all that could be desired, it gives an indication of the amount of leakage, and was the only method that could be employed that would enable us to put the line in operation at very short notice. The results are all on the safe side, and the actual leakage is probably less than the results would indicate. The line tested consisted of 7,480 feet of 24-inch pipe and 4,050 feet of 12-inch pipe, all laid with cement joints, and is equivalent to approximately 38,000 feet of 6-inch pipe.

The leakage would, therefore, be at the rate of approximately 108,160 cubic feet per mile of 6-inch main per year, or 54,080 cubic feet per mile of 3-inch main per year.

3. A mercury pressure test of 2 hours at 5 lbs. pressure was made on a mile of 12-inch main laid in 1907, with cement joints. No drop of pressure could be observed in 2 hours' time.

4. But all of the above high pressure tests are more or less unsatisfactory, and in order to get a better idea of actual conditions a number of joints were actually uncovered and bar-holes were made over a great number of others. The joints were selected at random throughout the city. An attempt was made to select locations where the probability of finding leakage was greatest. The results were as follows:

Size, inches.		Cement Joints Uncovered.	Leaks.
24	line (a)	4	No leak.
24	line (b)	2	No leak.
24	line (c)	2 (lead)	1 leak.
24	line (d)	12	1 small leak at bottom of bell.
5 lead joints uncovered.			No leak.

Four of these lead joints were exposed on a bridge and were practically the only ones in a mile of main with all cement joints. They were found slightly leaking last winter, and probably will have to be recaulked once a year.

24-inch line, d; bar holes made over 75 joints. Detected a very slight odor in one hole where main is laid 16 feet deep.

16-inch line, e; bar holes made over 1 mile of main. No leaks found.

16-inch line, f; bar holes over 16-inch high pressure line, where rock excavation was made for sewers. This is the line referred to in Table 5.

24-inch line, g (same as special test No. 2); 3 cement and 1 lead joints found leaking.

5. There are still a few wide streets in St. Louis where there are two street car tracks and a main on only one side of the street. Before rehabilitating the mains and services on one of these streets a test was first made. The street is brick paved and 80 feet wide between curbs, and the main was found 6 feet south of the south track, having been laid before the street was widened some 12 years ago. There were 33 services from this main, the greater part of which passed under the street car tracks. The total length of small pipe was 1,800 feet.

A test was first made by actually cutting out a section of pipe on each side of the street. The test showed a leakage of 1½ cubic feet per minute. A new main was then laid near to the curb on the opposite side of the street, and all services to houses on that side of the street relaid, and the old ones cut off from the old main. No work was done on the old main nor on the services on the south side of the street.

The test was then repeated and showed a loss of one cubic foot per hour, as compared with the previous loss of 1½ cubic feet per minute.

All pipe encountered during this work was inspected and found to be in fair condition, but in taking out some sections from under the tracks they were found to be in very bad condition. No amount of "barring for leaks" would have discovered this condition.

6. During the year 1890 there were laid in St. Louis several mains of wrought iron pipe with Converse couplings. One of these mains, 12 inches in diameter, was laid from Station "B" to Station "D," a distance of 3 miles. One thousand feet of this main were tested and found to leak at a rate of 46.8 cubic feet per hour. On examination the main was found rusted out in spots. Accidentally an old service pipe was found, it had been abandoned but never cut off from the main, and was leaking badly, After this service was cut off a second test was made of this same 1,000 feet, together with 2,500 feet additional, and was now found to leak only 1 cubic foot for the 3,500 feet of 12-inch pipe. I estimate we can still use this main for a period of perhaps 2 to 5 years. As the main was laid under average soil conditions, and in the year 1890, it would seem that the life of a wrought iron main under these conditions is approximately 23 years.

Another main, of the same kind of pipe, laid at the same date, was also tested. It is a 4-inch main and the test included 34 services in a distance of 440 feet, and was found to leak 24 feet per hour or at the rate of 288 feet per mile per hour, or 2,522,880 cubic feet per year. This main was taken up and replaced with a 6-inch cast iron main. Near the end of 8 lengths of the wrought iron pipe holes were eaten clear through the pipe, in some cases as large as 1 inch in diameter. Otherwise the pipe was in fair condition, and would indicate a life for wrought iron mains under these conditions of approximately 20 years. At the same time it is also clearly shown how the life of a steel or wrought iron main decreased where electrolysis exists.

The tests shown in Tables 10, 11, 12 and 13 cover:

10,436 feet of 3-inch, 18,979 feet of 4-inch, 32,239 feet of 6-inch, 5,230 feet of 8 inch, and 6,720 feet of 12-inch mains, or a total of 71,904 feet of main, 2,037 services, and 306 lamp services, exclusive of high pressure main tests. The services would measure about 107,961 feet, exclusive of street lamp risers. Assuming now that the tests represent a fair average of the leakage of the whole distribution system, it would seem to indicate a total actual leakage from mains and services in the low pressure system of approximately 50,000,000 cubic feet per annum, or about 1 per cent. of our output.

Leakage on 30 to 40 Pounds High Pressure Lines.—It is even more difficult to obtain any very reliable information of actual leakage on high pressure steel or wrought iron mains operating under 30 to 40 pounds pressure. In one system, made up of 123 miles of mains and services, varying in size from ¾ inch to 6 inches in diameter, a test was made by noting the drop in pressure during the night hours of practically no consumption. The test indicated a leakage of approximately 30,000 to 40,000 cubic feet per mile of pipe per year. But in speaking of leakage from high pressure mains it is well to bear in mind the fact that, while the actual leakage may be high, yet if reckoned on a basis of actual gas passed by these mains the percentage of leakage may be very low if reduced to a capacity basis of pipe delivery as compared with the capacity of low pressure mains. But the fact must be borne in mind that the leakage from a cast iron main will probably remain more uniformly constant from year to year, whereas the wrought iron or steel pipes will probably leak at a very much greater rate as years roll by. Some of the cast iron mains, tests of which are shown in this paper, are over 50 years old. What will the leakage be in wrought iron and steel pipes when they reach this age?

Wrought Iron Pipe versus Steel Pipe.—There has been much discussion relative to the merits of steel and wrought iron pipe. The principal difficulty lies in the fact that the steel manufacturers have been making changes in the manner of making steel pipe during late years, and it is exceedingly difficult to get a fair comparison between the different materials. From the personal experience of the writer the conclusion seems evident that steel pipe purchased, say 10 years ago, is inferior to wrought iron pipe which was purchased say 15 or 20 years ago. As an illustration. About a year ago we had occasion to renew a 1¼-inch steel service pipe which had been in the ground less than 5 years, owing to its leakage from corrosion. Before leaving the job the foreman discovered an odor of gas, and eventually found a ¾-inch service at the curb which was uncapped, except where it had been filled with clay. On tracing this service back to the main he found that it was an old pipe, laid possibly 20 years ago, at a distance of about 18 inches from the location of the new service. This ¾-inch pipe was undoubtedly wrought iron, and was in practically perfect condition, yet in this same soil the steel pipe had corroded out in less than 5 years' time; but even illustrations such as this do not tell the whole story, for there may have been some local conditions which might account for the different results obtained from the 2 pipes. It seems to be almost a rule that the smaller size service pipes, which in St. Louis are practically all wrought iron, are in better condition than the larger size services, and it may be, that owing to the smaller size pipe, it becomes more perfectly covered with the surrounding clay, which in some measure protects it, or there may have been some sort of coating on the pipe when originally laid. The natural rust covering, together with the clay which the rust seems to cement to the service, is very important, and was mentioned in the lecture given by Prof. Ganz some years ago at the Detroit meeting of the Institute.

Whatever the final decision may be, with regard to the relative value of wrought iron and steel, it is pretty safe to say that, while a bottle-tight main system may be constructed with the use of wrought iron or steel pipe, it will be practically impossible to make it remain so at a reasonable expense in large cities, where electrolysis exists. From a practical standpoint the question of steel pipe versus wrought

iron pipe is no longer so very important, as far as gas service conditions are concerned. It will be more profitable if attention is withdrawn for a while from this phase of the question, and an earnest effort made to find some form of covering for either wrought iron or steel pipe which will materially lengthen its life. The writer feels that this can best be done by the manufacturers, and it is to be hoped before many years have elapsed that we can buy a covered screw pipe which will have at least double the life of the bare pipe. At present city conditions are such that neither wrought iron, steel nor ingot iron will withstand the conditions; and at best, the difference in the life of either of them will be but a few years. What we want is a life of 30 to 40 years for our service pipes.

Fig. 5 represents a second manifold of pipe made up similarly to

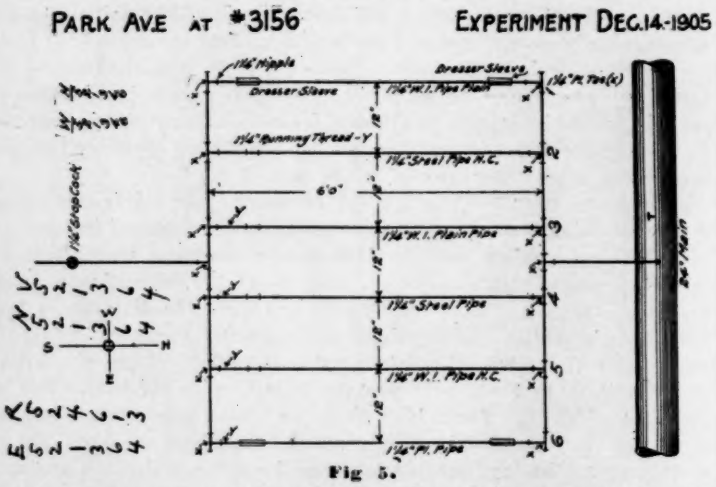

Fig. 5.

that shown in Fig. 4, for the purpose of obtaining more information relative to the merits of wrought iron versus steel pipe. The manifold was installed near the corner of Compton and Park avenues, this city, and, after remaining in the ground over 4 years, was taken up intact and sent to Detroit to be exhibited at the meeting of the American Gas Institute. Unfortunately it reached that city too late for exhibition. The location selected was a particularly bad one, and the services were eaten out periodically.

No. 1 was a wrought iron plain pipe with two Dresser insulating joints near the header.
No. 6 was the like, using steel pipe.
No. 2 was a 1¼-inch steel pipe, covered with our Nicholls' paper covering.
No. 5 was a wrought iron pipe with the like covering.
No. 3 was a 1¼-inch wrought iron plain pipe.
No. 4 was a 1¼-inch steel pipe.

Theoretically, a current passing from service to main should divide inversely as the resistance of these separate pipes. Pipes 2, 3, 4 and 9 should all carry equal amounts of current, practically speaking, but after 4 years in service the following results were found and agreed upon by some 8 engineers who inspected it:

No. 5 showed up almost perfectly.
No. 2 was second best.
No. 1 was agreed upon by all as being third best.
No. 6 all agreed was in the worst condition.
No. 3 and No. 4 all agreed were worse than 5, 2 and 1, but better than No. 6.

In merit these pipes stood in the following order:

No. 5 was a wrought iron pipe with Nicholls' paper covering.
No. 2 was a 1¼-inch steel pipe with Nicholls' paper covering.
No. 1 was wrought iron plain pipe with Dresser joints.
No. 3 was a 1¼-inch wrought iron plain pipe.
No. 4 was a 1¼-inch steel pipe.
No. 6 was a steel pipe with Dresser joints, with a difference of opinion as to the relative merits of 3 and 4.

Street Lighting.—In this city all lamps posts are equipped with a street gas lamp controller; 1,487 of these governors were tested and showed an average consumption of 3.007 cubic feet per hour. It is apparent, therefore. that whatever unaccounted-for gas is due from the street lighting system results more from early lighting and late extinguishing, and from small leaks, than from any other source. Nothing but constant supervision will avoid severe losses from this source.

If a street lamp is supposed to burn at the rate of 3 cubic feet per hour, a slight leak at the burner, or a leak caused by the pilot light not being entirely turned off will result in a leak which, while small, will amount to an important item in the grand total. If the street lamp is supposed to burn 3 cubic feet per hour for 4,000 hours per year, the consumption will equal 12,000 cubic feet per year. Now if there is a leak at the burner, say as small as $\frac{1}{10}$ cubic foot per hour, the total leakage in 1 year for the time the lamp is not supposed to burn will be 476 cubic feet, or very nearly 4 per cent. of the consumption paid for. If the leak is one that is a loss for the whole year we will have a net loss of 875 cubic feet per year, or 6 3 per cent. of the gas paid for. This illustrates the need of careful inspection and supervision over this class of work.

A Suggestion for a Better Method of Reporting Unaccounted-for Gas.—I think I have now shown that the great weakness of the standard distribution systems to-day is not in the cast iron mains, but in the wrought iron and steel pipes, and I recommend that the American Gas Institute adopt a new rule for reporting unaccounted-for gas for purposes of comparison, which shall take into consideration this fact, as well as some of the other features mentioned in this paper.

Since the object of studying the item of unaccounted-for gas is to determine the two important items of actual leakage from the distribution system, and unaccounted-for gas due to other causes, the principal of which is D. R., and slow-registering meters, it should be given in such terms as will take into consideration all of the factors entering into the problem. Every company should have on record the average per cent. of error of meters as they are returned from service. This average test will ordinarily be on the slow side, and the leakage should first be corrected by subtracting from the total unaccounted-for gas the per cent. equal to the average percentage of error of the meters as far as known. The leakage as corrected above now more approximately represents actual leakage from the system, which leakage, as shown in this paper, is not made up entirely from the escape of gas from the mains, but to even a greater extent from the leakage from the service pipes.

Probably the bulk of the larger distribution systems is made up of 6-inch cast iron pipe, and it has been shown that this size of pipe will probably remain at least as tight as any other size that might be chosen. It is suggested, therefore, that the 6-inch main be chosen as a standard, and all sizes of cast iron main larger than 6 inches be reduced to a 6-inch basis, and all cast iron mains less than 6 inches in diameter be considered as equivalent to a 6-inch main.

While the cast iron main will probably only leak gas at the joints, the opportunity for a steel or wrought iron pipe to leak is present at every point of the surface of the pipe, and it is important to note that, when once the service pipe is punctured, the opportunity for gas to escape is vastly greater than a joint in a cast iron main. The weight to give the steel or wrought iron pipe would depend strictly on the outside area of the pipe, but for practical purposes it is probably sufficient to consider all steel or wrought iron pipe as so many feet of 6-inch main. The leakage, as mentioned above, should then be divided by the sum of the cast iron pipe reduced to a 6-inch basis, where the diameter is above 6 inches, plus the actual cast iron pipe below the size of 6 inches, plus the total length of screw pipe, regardless of its size. While this method of describing unaccounted-for gas is not entirely satisfactory, it at least has the merit of giving weight to most of the important items which go to make up the unaccounted-for gas. If we let

U = unaccounted-for gas (corrected as suggested above),
A = length of cast iron pipe, 6 inches in diameter or less,
B = length of all steel or wrought iron pipe,
C = all cast iron pipe over 6 inches, reduced to 6 inch basis;

Then the leakage per mile of equivalent 6-inch pipe = $L = \frac{U}{A + B + C}$

Thus far we have only considered that portion of the unaccounted-for, known as "Actual Leakage." We now have to consider the gas lost to the company, due to the incorrect registration of consumers' meters. Assuming that the gas has been properly measured and corrected at the works, and that the meter when set in service is in proper condition, the correctness of registration will very largely depend upon the conditions surrounding the location in which the meter is set. In this respect gas companies have been very lax, and the comparison of the conditions surrounding the installation of an electric meter with those surrounding the installation of a gas meter would show up very unfavorably to the latter. It is to the interest of all concerned that a gas meter should be located where it will not be subjected to mechanical injury or to extremes in temperature. As a matter of fact, we find them frequently located under some of the very worst possible conditions. Mr. W. H. Gartley, Mr. J. A. Rusby and others have shown very clearly the effect of changing temperatures on meter diaphragms. While this subject is not in the province of this paper, yet it cannot be repeated too often that gas companies

should exert greater care and insist that meters be properly located. In these days, when the number of pilot lights of various kinds are being installed, it is more important than ever that the meter should register on the smallest possible flame.

A 71,306 lamp burning 4 cubic feet per hour for 3 hours per day will consume 12 cubic feet, and if the pilot burns for the remaining 21 hours, the consumption will be 2.1 cubic feet, or 17 per cent. of the consumption of the lamp while burning. This illustrates the great necessity of keeping our meters in the best possible condition.

The writer cannot agree that any very large percentage of unaccounted-for gas is made up in this latitude, at least on account of temperature conditions surrounding the meter, but the effect of the changing temperature in affecting the diaphragm certainly affects the registration of the meter, and undoubtedly a very large amount of gas reaches the consumer without being recorded on the meter dial. This subject of correct meter registration naturally brings up the question as to the advisability of making meters into "Dipping Meters," but inasmuch as this whole subject is being handled by the Committee on Meters, it would be better to await the results of the Committee's investigation. No mention has been made of steel pipe for mains, made up, for instance, like the Mannesmann steel tubes, which I understand are extensively used abroad. The published statements from foreign manufacturers are very flattering, especially when the pipe is covered with Hessian cloth or jute cloth impregnated with asphalt. Nor has any mention been made of the various types of cast iron pipe joints other than the standard bell and spigot.

The writer has confined his observations to, and has dealt only with, facts brought out in actual practice, and these do not show any excessive loss of gas from cast iron bell and spigot joints when the pipes are laid under the conditions under which the writer has had experience. There may be and possibly are, localities where other materials and other varieties of joints may prove effective, but at present I can see no great advantage that would result by a change to some other material, at least in our large cities.

Actual leakage can best be reduced by improving our service installation, and reducing the number of very small leaks at street lamp burners, supervising the lighting and extinguishing of the street lamps, locating meters in proper locations and using care in making service and main connections.

But the largest item in the unaccounted-for gas account is undoubtedly due to the improper registration of meters, the average tests of which are invariably on the slow side, but this paper attempts to deal only with that part of the unaccounted-for gas due to actual leakage in the distribution system, and if the discussion will bring out suggestions for better methods to reduce the amount of this item, the object of writing this paper will have been obtained.

[Continued from Page 355.]

PROCEEDINGS, SEVENTH ANNUAL CONVENTION, NATIONAL COMMERCIAL GAS ASSOCIATION.

Held in Denver, Col., October 24 to 28, 1911.

First Day—Afternoon Session.

The President introduced Mr. J. B. Douglas, Manager, Claim Department, U. G. I. Company, Philadelphia, Pa., who read the following paper on

PENSIONS AND PROFIT SHARING.

Increasing interest of late having been directed toward the subjects of pensions, retirement allowances or service annuities, and profit-sharing plans, adopted, or in contemplation, by public service and other corporations, and as nowadays one frequently hears inquiries as to what is being done along these lines by representative corporations for such of their employees as are deserving, have become superannuated after years of faithful and continuous service, or whose efficiency has been permanently impaired through accident or other disability, I shall endeavor to acquaint you in a general way with the progress made in this branch of the welfare field by corporations which are recognized as leaders.

Although public service corporations as a rule have not adopted, formally, systematic pension or profit-sharing plans, they nevertheless have been actually paying pensions and granting benefits for years past. With respect to pensions their course, as you doubtless know, has been to take up each worthy case individually, and to make an allowance according to its circumstances. In cases passed upon in this way, while employers have oftentimes paid more per case than they would have under the average pension or service annuity scheme, the number of pensions granted and the feeling of security on the part of employees have been less than would have been under a regular plan.

As the natural course of events in the business world of recent years has been in the direction of large consolidations, with a resultant lessening of individual enterprise, it is becoming more and more apparent that some means must be devised to stimulate the interest of the employee, to the mutual advantage of both himself and his employer.

In endeavoring to solve this problem, employers are constantly giving fresh evidences of willingness to assist their faithful and efficient employees, and of a desire to create in them an ever-increasing interest in the welfare of their company. Encouragement is being given employees along this line through the granting of pensions, the payment of bonuses for extra effort, and by affording them opportunity to purchase the stock of their company at attractive figures. In one instance within my knowledge, a corporation offers to purchase its stock on the open market for its employees and to carry it at the low annual rate of interest of 3 per cent., while it is paid for in installments. This is but one of a number of instances proving the progress of the co-operative spirit.

The attention now being given broad plans, designed to insure co-operation between employer and employee, is fast bringing corporations to the crest of a wave which will carry with it more than the present general interest in the subjects of pensions, or compensatory retirement allowances, and profit-sharing, and the result will be that ere long every representative corporation will offer even greater advantages to its employees—at least to those who have been faithful and whose services have been meritorious.

In the near future we may see insurance companies offering employers attractive rates on policies covering voluntary pension, retirement allowance, or service annuity plans, as they are interchangeably termed. At present these companies are issuing policies on compensation risks prescribed by law for injured employees in the State of New Jersey, and it would seem that a straight pension or service annuity business, which would appeal to the smaller corporations, would prove more profitable to insurance companies than the compensation risk.

The pension schemes which I shall review for your information are operated along practically similar lines. Those adopted by the International Harvester Company and the United States Steel Corporation furnish probably the best illustrations of the principles involved. The following outlines are taken direct from statements of the several corporations.

United States Steel Corporation.—In conjunction with the Carnegie fund, created in 1901, this fund was established in 1910, when $12,000,000 was set aside for the purpose. It is administered by a Board of Trustees, through a manager. Pensions are provided for employees of the Corporation, and of any other concern a majority of whose stock it owns or controls.

All men who have been 20 years or longer in the service, and have reached the age of 70, and all women of a similar period of service who have reached the age of 60, are retired and pensioned (compulsory). Persons employed in executive or administrative positions may be allowed to continue in service after reaching the ages stated. Any man who has been 20 years in the service and has reached the age of 60 years, and any woman of a similar period of service who has reached the age of 50 years, may be retired and pensioned at his or her request, or at the request of the employing officer. Any employee who has been 20 years in the service, and has become permanently totally incapacitated, through illness or injuries received while not on duty, may be pensioned. The Corporation pays no pension of more than $100 nor of less than $12 per month. Pensions are figured on the following basis:

For each year of service, 1 per cent. of the average monthly pay received during the last 10 years of service. As an illustration, an employee who has been 25 years in the service, and has received an average regular monthly pay of $60, receives a pension allowance of 25 per cent. of that amount, or $15 per month. Pensions are granted only to those who have given their entire time to the service of the corporations included under the provisions of the fund. The acceptance of a pension is no bar to the beneficiary engaging in other business not of the same character as the former employment, but no pensioner may re-enter the service. Leave of absence, suspension and temporary lay-off, on account of reduction in force, are not

(*Continued on page* 378.)

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NEW YORK, MONDAY, DECEMBER 11, 1911.

BRIEFLY TOLD.

MR. W. A. HARRINGTON, the wideawake Manager of the American Meter Company, has favored us with a copy of its Calendar for 1912—it really cards 13 months, in that its first sheet is dated December 1, 1911, to December 31st, 1912. This arrangement was due to the necessity existing for the timely placing of the phases of the moon in respect of adjusting the schedules of public lamp lightings based on all night and part night contracts. Its get up from the point of the printer is irreproachable. Mr. Harrington wishes us to say that those desiring a copy of the calendar should address the Company's main offices in New York city, which are in the premises 11th avenue and 47th street.

DR. ALEXANDER CROMBIE HUMPHREYS CHOSEN PRESIDENT.—Officially, and from the "Press" of the American Society of Mechanical Engineers, we learn that, before a great assemblage of prominent engineers, in their building at 29 West 39th street, New York, Dr. Alex. C. Humphreys, already prominent as President of Stevens Institute, and one of the foremost gas plant engineers in the country, was installed, the evening of the 5th inst., President of the American Society of Mechanical Engineers. Col. E. D. Meier, the retiring President, in introducing Dr. Humphreys to the Society as its new President, spoke in part as follows: One of the glories of the engineering proression lies in the opportunities it offers for service to others, and of this truth Dr. Humphrey's career is a notable example. He entered Stevens Institute of Technology with the Class of 1877, handicapped as few men ever were. Soon after graduation, Mr. Humphreys became Chief Engineer of the Pintsch Lighting Company, of New York. In 1885 he was made Superintendent of Construction for the United Gas Improvement Company, and shortly afterward took the position of General Superintendent, with headquarters in Philadelphia. Eventually he assumed control of the entire commercial management of all the Company's works, including the Welsbach Company, which at that time was a subsidiary of the U. G. I. In August, 1894, Mr. Humphreys retired from his official relations with the United Gas Improvement Company to establish the firm of Humphreys & Glasgow, of New York, recently succeeded by the firm of Humphreys & Miller, Inc., of which he is President. In June, 1902, Mr. Humphreys was elected President of Stevens Institute of Technology, by unanimous vote of the Trustees. In 1903, the degree of Doctor of Science was conferred upon him by the University of Pennsylvania, and the degree of Doctor of Laws by Columbia University. New York University also conferred the degree of Doctor of Laws in 1906, and Princeton University in 1907. Dr. Humphreys has been the chief executive of more than 35 gas and electric light companies, and is now President of the Stevens Institute of Technology, Humphreys & Miller, Inc., Gas Engineers, and the Buffalo Gas Company. He is a Director in the Equitable Life Assurance Society, a a member of its Executive Committee, and a trustee member of the Executive Committee of the Carnegie Foundation for the Advancement of Teaching. He is a member of almost every prominent technical society in this country; of the Delta Tau Delta Fraternity, and of many clubs and philanthropic societies, to all of which he gives liberally of his time and strength. In assuming the duties of President of the American Society of Mechanical Engineers, he is adding greatly to his present responsibilities, and yet such is his capacity for service for others that we who know him know that the affairs of the Society will be in as sure and safe hands as ever before, and that the Society is fortunate indeed in having for its President during the year to come Dr. Alex. C. Humphreys.

Replying to these remarks of ex-President Meier, Dr. Humphreys, in accepting the Presidency, referred to the fact that the Society was organized at Stevens Institute, and that Dr. Thurston, then Professor of Mechanical Engineering at the Institute, was elected as first President of the Society. In acknowledging the honor conferred upon him he referred to the heavy responsibility involved in accepting the office, especially in view of the dividing and sub-dividing of the engineering profession into so many specialties, and in this connection he referred to the movement recently inaugurated in the Society by the appointment of sub-committees of the Meetings' Committee to provide studies and papers on the many industries which might be considered as related to the profession of Mechanical Engineering, there having been about 40 such committees suggested, with, no doubt, more to come. While recognizing the need for this closer and closer specializing in engineering and industrial management, he deprecated the multiplication of Societies. In this connection he expressed the hope that means would be found to keep the direction of this movement within the Socieiy while providing the fuller measure of home rule for each section, consistent with an efficient system of co-operation. To develop a system of such wide scope would require great good judgment and tact on the part of all concerned, for the opportunities for disagreement and friction must, for safety, be at once recognized. Here would be an opportunity for the engineers of the country to show their capacity for effective service in the community at a time when such service is needed as never before. He also drew attention to the fact that the extension of the Society's activities along the lines referred to would call for greatly increased financial support.

"WASSER UND GAS."—Such is the title of a new semi-monthly publication, published by Herr Erwin Stein, Berlin, the first number of which bears date of October 1st, 1911, and issued through the press of Gerhard Slatting (Oldenburg). As its title page declares its purpose is to further the interests of water and gas and of the builders of apparatus and appliances used by these industries. In appearance it is something like our old friend and contemporary, the *Journal für Gasbeleuchtung und Verwndte Beleuchtungsarten, So wie für Wasserversorgung*, more generally termed and briefly known as "The German Gas Light Journal," now nearing it's 59th volume. While we cannot perceive that the new publication is "Filling a long-felt want," since the older publication has always covered the ground most efficiently and admirably as well, we can compliment the publishers of the later periodical on the fine appearance of its initial number. It looks to us that "Wasser und Gas" is aiming at the utmost brevity in the giving of its message to the reader, which is often most commendable, since only the few who may make any subject a specialty care to devote the time required to read pages of matter which eventually could be better as it were condensed "in a nutshell" in the final paragraphs. However, the new publication has not been able to entirely escape the above method of descriptive writing, for in one of its longer articles it is seen that in a well-illustrated, 7-page paper on "The Suspended Compressed Gas Lamp and Its Relation to the Flaming (Electric) Arc Lamp," the "kernel of the nut" is in the last 10 lines of the article, the conclusion being most encouraging to gas men, inasmuch as it is that the inverted, *compressed* gas lamp is more economical than the flaming electric arc light. The article in question is by Dr. Bertelmann, of Waidmannslust, near Berlin, Germany, who, moreover, appears thoroughly conversant with his subject. A decidedly scholarly and interesting article is one by Engineer H. Kröner, Director of the City Technical Academy, of Friedberg, Germany, but it is of more special application and inter-

est to managers of water works systems. On the whole this addition to our technical literature leaves a pleasing impression with the reader, and will not unlikely be welcome to such as have spare time to devote to the perusal of its pages.—F. E.

ENGINEERING PROBLEMS IN THE COMMERCIAL END.—The commercial (or business) end of the gas industry has been quite properly free from technical subjects, as far as meetings devoted to its advance are concerned, although there are numerous instances where engineering knowledge is required by the successful salesmen. A general knowledge of gas manufacture and more specific knowledge of its distribution and measurement should form a basis for more extensive knowledge of the correct methods of piping and connecting appliances and their use. The proper size and location of gas pipes, and the location of the outlets so as to provide an ample supply for all probable use of gas for light, heat and power, are subjects which are often passed by, as being well understood by architects, plumbers and even owners, while, as a matter of fact, the buildings which are properly piped are all too few. The type of domestic fuel appliance which is suitable is generally selected by rule-of-thumb, while much more extensive use of these appliances could be obtained, were like engineering ability called in; for instance, as is the case where industrial appliances are installed. The time is not far distant when practically all gas burning appliances will be connected by means of all metal connections, and much expense and annoyance will be prevented by arranging outlets for their connecting. The fact that a great division of opinion exists as to the advisability of connecting ranges and water heaters as well with flues indicates that this subject will receive much attention and discussion. These discussions will greatly aid in disseminating knowledge of gaseous combustion, which will help the salesman as well as the engineer. What is true concerning the advisability of greater knowledge in the selection of domestic appliances, is true to a large extent in lighting. Illuminating engineering has brought good where it has been practised, as will any kind of engineering that is well handled. The sales' departments of gas companies require the aid of engineering if they are to bring the day near to the use of gas as the greatest modern agent of convenience.—LUMINO.

CURRENT MENTION—

"B.," WRITING from Waterbury, Conn., under date of the 5th inst., says: "Mr. C. G. Goeltz, Managing Engineer of the Old Colony Gas Company, which has piped up the contiguous centers of Weymouth, Braintree, Rockland, Abington and Whitman, Mass., told me to-day that gas would be turned into the mains Monday next. The distributing system consists of 50 miles of high pressure pipe, and up to now the applications for gas service exceed 1,000. The Company commenced the sale of appliances, and has arranged for the opening of two up-to-date showrooms, in Braintree and Rockland, respectively; the soliciting force in each numbering 5. The Selectmen and various other officials of Braintree and Rockland, the newspaper men and the officials of the different trades' associations, have been invited to a banquet which will be given by the Company in Braintree, the evening of the 18th. This entire equipment has been completed within 6 months, and it has not been slighted in the least degree; all of which speaks right well for the cleverness of Engineer Goeltz and the steadfastness of his men."

MR. ALBERT HOWE, who has been in charge of the Logan (O.) Gas Company's Fremont (O.) office, has been instructed to assume charge of the Company's affairs at Elyria, O. Mr. P. H. Bailey, formerly in command at Bellevue, O., goes to Fremont, and the latter's successor at Bellevue is Mr. Albert Lewis, of Columbus, O.

MR. W. E. HARTMAN, Chief Engineer for H. Koppers, Constructor of by-Product Coke and Gas Ovens, with headquarters in Joliet, Ills., sailed last Wednesday for Europe. He intends to make a critical study of European construction and methods of operation, along the lines of coke and gas ovens. He will return in 6 to 8 weeks. Safe journey to you, Mr. Hartman.

THAT the projectors of the gas plant for Statesville, N. C., mean to go on would seem from their filing with the City Clerk 2 bonds (respectively in $5,000 and $2,000, guaranteeing the making good of any damage to the streets occasioned by their pipe laying operations. A site has been purchased, and many Statesville people have subscribed to the shares.

ADVICES by way of Janesville, Wis., dated the 2d inst., are to the effect that, at a meeting of the Milton and Milton Junction (Wis.) Co-Operative Gas Company, the Directors were instructed by a practically unanimous vote of the shareholders to sell the plant to the Ellis Company, of Indianapolis, Ind., which concern agrees to install an up-to-date plant and run it 10 years, furnishing gas at the figures theretofore charged by the former Company.

MR. W. A. ALDRICH left Grand Rapids, Mich., a few days ago *en route* for Monterey, Mexico, at which point he will construct a coal gas plant under the franchise obtained some time ago by Messrs. McKenzie & Mann, of Toronto, Canada. May continued success be his portion.

ON the evening of December 4th the Board of Aldermen, of Elizabeth City, N. C., unanimously granted a franchise for the manufacture and sale of illuminating gas in that city, to the projectors of the North Carolina Gas Company. The officers of that corporation are: President, Mr. A. M. Worstall; Treasurer, Mr. Jas. Gamble.

LAST May, during the meeting in Pittsburgh, Pa., of the American Society of Mechanical Engineers, Col. Edward D. Meier, President of the Society, was presented by a number of the members with an address of congratulation, which was gotten up in beautifully illuminated style. He at the same time consented to sit for his portrait. The latter was finished in time to exhibit at the recent meeting of the Society in New York city. The likeness is a striking one, and shows the sturdy old hero as he is—he entered into his 71st year last May, having been born in St. Louis, Mo., May 30, 1841. Graduating from Washington University, St. Louis, and later from the Royal Polytechnic College, Hanover, Germany, his first active work was to serve an apprenticeship in the Moran Locomotive Works, Taunton, Mass. At the outbreak of the Civil War he enlisted as a private in the First Louisiana Cavalry, and, on May 30, 1865, as a Lieutenant in that regiment, received the surrender of Lieut.-Gen. Jno. B. Hood and staff. In the 20 years succeeding the Civil War, Col. Meier was successively connected with the Kansas Pacific Railway, Illinois Patent Coke Company, Meier Iron Company, St. Louis Cotton Factory and the Paper Hydraulic Cotton Press. In 1884 he organized the Heinie Safety Boiler Company, which introduced into the United States the water tube boiler of that designation, and he has served it as President and Chief Engineer ever since. He was also responsible for the introduction of the Diesel engine into America, and until 3 years ago was Engineer-in-Chief and Treasurer of the American Diesel Engine Company. He is a Past-President of the American Boiler Manufacturers' Association, and of the Machinery and Metal Trades' Association.

THE hearing on the prayer of the Selectmen of Attleboro, Mass., for a revision of the gas rate charged by the local gas suppliers, which was set for the 1st inst., was postponed to the 19th inst., at the request of our old acquaintance, Mr. Alton D. Adams, whose retaining by the city as its special attorney in the premises likely assures him of a cheery Christmas dinner. It seems too bad that Bemis and Marks have not received retainers in this instance; however, the Selectmen have ample time wherein to overlook their seeming forgetfulness. The Gas Company will be represented by Mr. E. W. Burdett, of Boston. Mr. Burdett, by-the-way, is the legal representative of the Massachusetts Electric Light Association.

WRITE to the Rochester (N. Y.) Railway and Light Company for a copy of its handsome brieflet entitled "A Unique Rochester Organization." The tone of its paragraphs is decidedly "Searlesque."

Publications.

[All Publications, Catalogues, etc., mentioned below, are kept in our office for the convenience of our patrons.]

A Primer on Explosives for Coal Miners.—Bulletin No. 17; U. S. Bureau of Mines.

The Earning Power of Chemistry.—By Mr. Arthur D. Little. Reprint of lecture delivered June 29, 1911, under the auspices of the auspices of the Indiana Section of the American Chemical Society.

Natural Gas Association, 1911; Proceedings.—The work at the sixth annual meeting, and other various routine matters of the Natural Gas Association, have been compiled and edited by the Secretary, Mr. T. C. Jones, who has distributed the volume to its members. These, it may be said, number 620.

(*Continued from page* 375.)

counted as breaks in the continuity of service, and the time loss is not deducted in figuring the length of service. Dismissal or voluntary absences from the service followed by reinstatement within 2 years are not considered breaks in the continuity of service, but the time thus lost is deducted in figuring the length of service. Pensions terminate the month following the death of the beneficiary. They may be withheld or discontinued in case of misconduct or other causes sufficient in the judgment of the Board to warrant such action.

The Corporation does not permit pensions to be assigned nor attached. It also states that the fund is purely a voluntary provision and that neither the creation of the fund nor any other action gives any employee a right to be retained in the service. It further provides that, should the pension allowance create demands exceeding the income from the fund, a new basis may be adopted reducing the pensions theretofore or thereafter granted.

The International Harvester Company established its fund in 1908, and may pay as much as $100,000 annually in pensions. In general the system is the same as that just described. To voluntarily retire, however, men must have reached the age of 65 years and have been 20 years in the service. Temporary lay-off, on account of illness, or a reduction in the force is not considered a break in the continuity of service; but when absence is of more than 6 consecutive months' duration it is deducted in figuring the length of service. A person out of the service for 2 years or more re enters only as a new employee.

Pension allowances may be continued to widows and orphans for a limited period. The maximum monthly pension is $100 and the minimum $18. In special cases, where the term of service is less than 20 years, the pension and the amount of same, if any, are determined by the Board.

According to plans adopted last January, by the Public Service Corporation of New Jersey, employees reaching the age of 65 years, after completing 25 years of continuous service, are entitled to retire on pension; and any employee reaching the age of 70 years, after 20 years of continuous service, is retired on pension (compulsory). The minimum is $20 per month, and no maximum is stated.

The Corporation stipulates that pensions are for the personal benefit of the beneficiaries; that if the "right" of the beneficiaries becomes so alienated as to preclude their receiving the same, the "obligation" of the Company to pay such benefits shall thereupon cease.

The pension plans adopted by representative railroad companies of the country are much the same as those of the United States Steel Corporation, which I have taken as the standard. The essential features wherein they differ from the standard, however, may be noted as follows:

The Pennsylvania Railroad.—Plan effective January 1, 1900. Of the employees required to give their entire time to the Company, the following are relieved from the service: All officers and employees reaching the age of 70 years, and all officers and employees 65 to 69 years of age, who have been 30 or more years in the service and have become physically disqualified. No individual pension limits are stipulated.

Rock Island Lines.—This Company's plan became effective January 1, 1910. Like the Pennsylvania Railroad, it retires all officers and employees at the age of 70 years. Locomotive engineers and firemen, conductors, flagmen, brakemen, etc., may be retired at the age of 65. Such officers and employees as have been 20 years in continuous service at the date of retirement are pensioned. Those 25 years in continuous service, who have become permanently incapacitated, may be pensioned regardless of age.

Leave of absence, suspension, dismissal followed by reinstatement within 1 year, or temporary lay-off on account of reduction in force, do not constitute breaks in the continuity of service. No persons leaving the service of the Company, except as above, prior to retirement, are granted pension allowances. Pensions are limited to maximum and minimum amounts of $150 and $20, respectively. The Company has set aside no regular sum as a pension fund, and the amount required is charged out each month to operating expenses.

New York Central and Hudson River Railroad.—This Company's plan was put in effect at the same date as the one last mentioned. All employees attaining the age of 70 years are retired, and those 10 years continuously in the service immediately preceding retirement are pensioned. Any employee 20 years in continuous service who has become unfit for duty may be retired. The Board may establish a new rate if pensions create demands exceeding $225,000 annually.

Another railroad adopted its pension plan in 1902. A very creditable feature of this plan is covered by a provision that any faithful employee, irrespective of age or length of service, who receives injuries in the performance of duty which totally incapacitate him, or who is so incapacitated through illness, may be awarded a pension for such length of time and of such an amount as the President may determine. If the demands on the pension fund amount to more than $75,000 annually, a lower basis of computation may be established.

Illinois Central Railroad.—This Company adopted its pension plan in 1901, setting aside $250,000 for the purpose. The sum of $100,000 may be added annually to this amount. The system in general is similar to those heretofore noted. It provides, however, that employees between the ages of 61 and 70 years who are incapacitated for further service may be retired and pensioned. Leave of absence, when attended by other employment, except when duly authorized, constitutes a break in the continuity of service.

The Western Electric Company put its present pension plan in effect in 1906. The features peculiar to this plan are: The Company set aside $400,000 as a nucleus and may add to this amount $150,000 annually. Any employee 30 years continuously in the service, or who has been 25 years continuously in the service and has reached the age of 55 years, may, on the recommendation of the President of the Company, be granted a pension. Any employee 10 years in continuous service, who becomes totally incapacitated, may receive aid from the pension fund at the discretion of the Board.

The Board may base a pension, at its discretion, upon the average annual pay of the 10 consecutive years of service during which the applicant was paid the highest rate of wages. Pensions may continue to widows and orphans for as long a period as 1 year after death of any retired employee.

The pension plan of the Edison Electric Illuminating Company of Brooklyn is also a departure in a way. It provides for the pensioning of its employees at the discretion of a Provident Committee. The rate of pension is not less than 1 per cent., nor more than 2 per cent., per year of service, of the employee's average pay for the 5 years next preceding retirement. Employees reaching the age of 65 years, after at least 10 years of continuous service, are given the "right" to retire upon pension.

The Standard Oil Company, in 1909, adopted a very simple and broad plan for service annuities. As it is quite different from the other plans mentioned, I am quoting it in practically its entirety:

Any officer or employee who has given 20 years of continued and satisfactory service to the Company and has attained the age of 65 years, may be put on the annuity roll, at the discretion of the Directors, and receive for the first year after retirement an annuity of 50 per cent. of his or her average pay for the 10 years preceding retirement, the annuity after this first year to be continued at the rate of 25 per cent.

Any officer or employee between the ages of 60 and 65, who has been 20 years in the service of this Company, may retire at his or her own request, provided the Directors approve, or be relieved by the Directors from further service and placed on the annuity roll at an annuity equal to 50 per cent. of his or her average pay for the 10 years preceding retirement, such rate to be continued up to the time the recipient is 65 years of age, and thereafter at the rate of 25 per cent., the annuity at the rate of 50 per cent. to be for not less than a period of 12 months. Annuities are to be paid quarterly, and terminate on the death of the beneficiary. The Directors reserve the right at any time to abolish or modify these annuities, both in their general form and in their application to individuals.

Many of you are doubtless familiar with the valuable report on the exhaustive investigation of the Public Policy Committee of the National Electric Light Association (Mr. C. L. Edgar, Boston, Chairman), which was read at the recent convention in New York city. This report being much in point here, I am giving you the benefit of some of the Committee's thought.

They stated in part: "* * * Our opinion is that service annuity is to be paid as a form of compensation for a definite service that cannot be rightfully included within ordinary wages. It is compensation for *continuous* service over a period of several years. * * * Any contribution for the improvement of an employee's surroundings or of himself should not be construed as affecting his wage in the slightest degree. * * * It might be pointed out that an employee performs his technical task for a definite wage; in addition he can, and often does, render his employer service by working *continuously* and in exercising a degree of devotion which affects not only his own work, but that of all other employees associated with him. Thus, in *continuous* service, with other advantages, we have

enhanced *efficiency;* with increased devotion to his employer, 'soldiering' becomes lessened or eliminated; in a more careful utilization of tools and materials, still other economies and efficiency may be expected; * * *."

To encourage this improved service, the Committee recommends the following: Annuity for males at 65; for females at 60, in each case where there has been continuous and satisfactory service for 10 years. They also recommend that employees who have given 10 years' satisfactory service, and have become unfit for duty, be retired at any age, and given service annuities. As a basis for these annuities, 1 to 2 per cent. of the yearly wages during the highest 10 consecutive years of employment, for each year of continuous service, was suggested.

The American Telephone and Telegraph Company, which operates the Bell Companies, while it has not formally adopted a pension plan, states that it has given much thought to the subject. In its last annual report I notice a statement in effect, that the Company has recently been considering a liberal scheme for pensioning employees. The Company states that each meritorious case is at present acted upon individually, so that the benefit to employees is not delayed.

The Consolidated Gas Company, of New York, now has what it terms a "Superannuation List," to which deserving employees are retired at the discretion of the Company. The usual course is to allow 1 per cent. for each year of service, based on the average pay for the 5 years preceding retirement.

Brooklyn Rapid Transit Company.—This Company put its plan in effect in January, 1910, after which all employees in order to receive pensions must be members of the Employees' Benefit Association. Employees 35 years in continuous service receive 50 per cent. of the average monthly pay received during the last 10 years of service; those in continuous service 30 years, 40 per cent.; and those 25 years in continuous service, 30 per cent.

No employee who has received a salary exceeding $1,500 per annum for more than 5 years is eligible to the benefits of the pension fund.

Among the prominent newspapers, the Chicago *Tribune* established a pension system several months ago, according to the provisions of which all employees who have reached the age of 60 years, and have been 20 or more years in the service, may, at the discretion of a pension board, retire from active service and become eligible to a pension. All employees 20 or more years in service may, at their own request, be retired at the age of 65. Executives are exempt from the maximum age limit. No pension exceeds $100 per month, or amounts to less than $18 per month.

The Philadelphia Electric Company.—In April last, adopted a service annuity plan. It applies to all male employees reaching the age of 65, and female employees reaching the age of 60, after having a continuous satisfactory service record of 10 years for the then present employees, and 15 years for future employees. Pensions are figured upon a basis of 2 per cent. of the average wages during the highest 10 years of employment, multiplied by the number of years of service. It also applies to any employee with 10 or 15 years of satisfactory continuous service who has become unfitted for duty. In this connection it should be of interest to note the following editorial comment on this action:

"This is in accordance with the modern trend of sentiment and thought. Nowadays the old theory that the relation between the employer and employed is exclusively a contractual one, a mere question af selling so much labor for so much money, is getting to be pretty generally discarded. It is coming to be recognized that the whole duty of the employer has not been discharged when he pays the stipulated wages, that the normal superiority of his position imposes obligations as well as confers advantages, and that he is under moral *responsibility* to extend some measure of protection in consideration for the service he receives. It is especially getting to be more and more acknowledged that the man who has done good and faithful work during the period of his validity ought not to be thrown on his own resources, or in other words, cast adrift, in his declining years."

The objection to some of the pension plans in effect to-day is that, with only few exceptions, an employee has to practically work out his life, or reach an age when he is not capable of enjoying the few remaining years, to become eligible to its benefits. It is a fact that the longevity of the hardest and most worthy workers, with either brain or brawn, is less than that of those whose efforts class them as merely servers of time, and consequently the long-term pension in the main benefits more drones than real workers.

Some of you will be surprised to hear that, of 1,000 men averaging 30 years of age, employed by a public service corporation, for instance, but 451, including those who would resign or leave the service, would be surviving at the age of 70 years to benefit from a pension scheme; and that at that age, according to the American experience of mortality, their average expectancy of life would be less than 8½ years. Bearing on the same men and average age, the following is of interest:

Average Age of Employees.	Number Surviving at Ages				Expectancy of Life at Ages			
	50	55	60	65	50	55	60	65
30 years.	817	756	678	578	20.9	17.4	14.0	11.1

I cannot give you an accurate statement of the average number of employees in the United States who would withdraw from the service during the periods mentioned; but, according to the experience of English railways, of 1,000 men entering the service at age of 18, only 17 continued in active service up to age 65. This experience shows heaviest withdrawal from the service among the young men; that is, those up to age 35. From this you will get an idea of the relatively small number who benefit by long deferred pensions, and of the short average duration of such pensions.

It is not, therefore, evident that employees of public service corporations should receive benefits from pension plans broader than those at present in operation; that it should be their right to retire and be pensioned after, say, 25 years of satisfactory service, if 60 years of age? And would it not be but fair, particularly in the absence of a profit-sharing plan, for the pension, retirement allowance or service annuity to be graded up to 3 per cent. of the average monthly earnings during the 10 years of continuous service in which the employee received the highest wages, for each year of service? These questions, to my mind, should be answered in the affirmative, although I do not believe pensions should be figured on more than 25 years' service. The Hon. Franklin McVeagh, Secretary of the Treasury, recently said in effect that he had outlined a pension plan for his department, which, although it would involve the immediate placing on the pension roll of a number of his employees, would, he felt sure, almost pay for itself through increased efficiency in the department, as he would be able to replace such pensioners by a fewer number of younger and more capable men. This same idea is held by other advocates of pension plans.

On the 3 per cent. basis, the pension of a person employed 25 years, whose average wages during the 10 years of service were $70 per month, would be $52.50. Of course, to protect the large majority of wage earners, a maximum individual limit should be provided in each plan. Gas companies in general have not adopted systematic pension, retirement-allowance or service annuity plans to the same extent that has been the case in other manufacturing concerns and railroads; but I believe that, if the gas companies of the United States are going to maintain well balanced progress, the time has arrived for them to make definite pension provision for those of their employees who are entitled to it. In addition they should take up general welfare work.

Consider the splendid progress made by the several component departments of the average gas company of to-day! Does it not seem that definite provision should be made for those responsible for this progress, through pensions, retiring allowances or service annuities?

Some are of the opinion that pensions are but a deferred form of profit-sharing, and that, such as being the case, where but one of the two is possible, direct profit sharing is preferable. To my mind, however, of the two, a good pension or service annuity plan is the more desirable, as it best conserves the interests of the great mass of wage earners who are neither thrifty nor saving. Speaking upon this subject recently, Mr. G. W. Perkins, formerly of the firm of Messrs. J. P. Morgan & Co., and a recognized authority on welfare work, said:

"The men of an organization managing any given business, including all workers, should be paid their salaries and wages for rendering service of a kind that would earn the amount of money necessary to keep the business rehabilitated; to pay interest on any bonded debt there might be; and dividends on preferred shares of stock, when conservatively issued. If this organization of men, brain workers and hand workers together, should develop so high a type of efficiency that their efforts would produce more profits for the concern than is neceesary for these purposes, such profits would naturally go to what are known as common stockholders, and at this point the organization of men who carry on the business should share with the common stockholders this extra profit earned. * * *

Broadly speaking, *this basis of profit-sharing would have enormous advantages all round.*"

Remarking, further, Mr. Perkins said: "There is a vast difference between the work that a human being performs in a perfunctory, machine-like manner and the work that he performs with a keen, loyal interest in what he is doing; and in just this difference does success come to the individual and come to a large concern, if it be so fortunate as to have a force of individuals who are working with this spirit." To this I might add: Pensions and profit-sharing are to the army of workers, great factors in the encouragement of this much-to-be desired spirit of genuine, get-together co-operation.

Several corporations give their employees a division of the profits annually, or frequent opportunity to acquire their stock at attractive figures. The International Harvester Company follows these courses. in addition to its pension scheme. It sets aside annually a certain sum of money, the amount being governed by the Company's profits, to be distributed among its employees. The sales department's share is based on increased sales and decreased expense; that of the manufacturing department on increased production and decreased cost.

The Company in 1909 stated that it desired "all employees *upon whose efforts the success of the business depends*, to have a share in the profits." It gives the employees opportunity to subscribe for its stock on the following basis:

An allotment of preferred and common stock is made and the amount per share (below market) for which it may be purchased is stipulated. Each employee may subscribe for an amount not exceeding his annual wages, and payment for the stock is deducted from the employee's wages monthly, up to 25 per cent. of a month's salary. The subscriber has 5 years in which to pay for his stock, and interest on the deferred payments is charged him at the rate of 5 per cent. per annum. From the date payments begin, dividends on the stock (7 per cent. on preferred) are credited as part of the subscriber's payment, and the stock is issued as soon as paid for in full.

To increase the subscriber's interest, a special allowance of $4 and $3 per share is made on the preferred and common stock, respectively, for 5 years following its purchase, and if the subscriber remains continuously in the Company's employ for 5 years after the purchase of the stock, the Company grants him a further allowance, figured as follows: "Any subscriber discontinuing payments before his subscription is paid up is not entitled to the $4 and $3 per share referred to, and those amounts are paid into a special fund bearing 5 per cent. interest. At the end of the 5 years' period, the total amount thus accumulated is distributed according to the shares of stock owned among the subscribers who have remained with the Company, and made their payments during that period.

The profit-sharing plan in operation with the United States Steel Corporation is largely the same as that just outlined. An employee cannot, however, subscribe to stock equal in value to the amount of his annual wages or salary. For instance, an employee making $800 yearly can subscribe to but $160, and an employee making $3,500, to but $440, worth of stock at prices stipulated (below market). The stock must be paid for in 3 years. This plan, I am informed, has netted subscribers an investment of over 12 per cent.

The method of rewarding deserving employees in force with the Boston Consolidated Gas Company is both unique and attractive to its employees. The Company regards it as better that the ordinary pension system, in view of the fact that the employee has "Constantly before him the welfare of the Company, which is so closely connected with his own receipts in the form of shares and dividends." The plan of the Company is to offer the most efficient employees, over and above their regular compensation, an annual share in the profits of the Company, called a premium, and calculated on annual salaries or earnings at the same rate as dividends on its stock, to be applied towards the purchase of stock of the Massachusetts Gas Companies. As the rate at which dividends may be declared or increased depends upon economy in furnishing gas, the employee has a great incentive to work as efficiently as possible.

Persons who have been in the employ 1 year or more are eligible, providing their work has been such as to warrant participation, opinion as to the latter being based upon advices of the immediate superiors of the employees. The plan is designed to include all employees who are temperate, energetic, honest, capable and efficient, or those who have displayed the greatest regularity, intelligence and energy in the Company's business. In calculating premiums no deductions are made on account of sickness of less than 2 months. If of longer duration, corresponding deduction is made. Premiums are declared twice yearly. A separate account is kept by the Company for each employee, and the amount of premium declared is placed to his credit. When the amount is sufficient to purchase one or more shares of stock at the market price, the Company will pay the employee in cash or buy the said stock for his account. Undisposed-of premiums remain to the credit of the employee, and draw 4 per cent. per annum. Employees may sell their stock at any time. At last reports, 700 out of about 900 of this Company's employees were profit sharers.

The Proctor & Gamble Company, of Cincinnati, O., in 1887 adopted a scheme providing for the semi-annual distribution of cash, in amounts equal to a percentage of the employee's wages. The dividend, as the payment might be called, on employees' wages was at the same rate as that paid by the Company on its common stock.

The Company states, because of the fact that in a large percentage of cases the profit-sharing dividend was neither invested nor saved, and was regarded by the employees as part of their salaries, it made a radical change in 1903, and adopted a plan providing dividends through stock ownership, which it considers an unqualified success. According to the Company's latest revised plan, for employees earning up to $1,500 per year, the Company offers to purchase its common stock for them of value exactly equal to the amount of their annual wages, provided the employees pay in cash at least 2½ per cent. of the cost of the stock, and thereafter not less than 4 per cent. thereof annually. The Company credits these subscribers with the regular dividends of 12 per cent. per annum upon the amount of each subscriber's annual wages, which special dividend is guaranteed, and charges them 3 per cent. per annum on the balance due. When the stock has been paid for in full, the Company issues to the subscriber what it calls a paid-up trust receipt, and the Company thereafter pays in cash direct to the subscribers both the trust receipt dividends and the regular dividends on the stock held under the plan. The Company does not permit the assignment of these trust receipts.

If an employee who has held a trust receipt for 2 years or more desires to withdraw the stock held in trust for him or its money equivalent, he may do so by giving the Company 90 days' notice. The Company will then give him either certificates of its common stock or their money equivalent, based on the market price of the stock at date of the said notice.

On the same basis, after an employee has been a shareholder for a term of 5 years, he may increase his holdings of stock to the extent of 25 per cent. of his annual wages, upon which latter purchase the Company credits him a trust receipt dividend at the rate of 15 per cent. of his annual wages annually, in addition to the regular dividend on the stock represented by the trust receipt. When an employee has been a shareholder on the plan outlined for 10 years, he may on the same plan increase his holdings of stock by an amount equal to 50 per cent. of his annual wages, and receive from the Company a trust receipt dividend of 18 per cent. per annum.

Employee subscribers, whose wages are increased beyond $1,500 per annum, who have paid for their stock in full, receive at once certificates of stock upon surrender of the paid up trust receipts. The money paid by and credited to each employee under this plan is guaranteed by the Company against loss through decline in the value of the stock held for him below the amount of money standing to his credit.

Fels Company, of Philadelphia, have for several years been sharing profits with their employees on the following basis: Employees in the service of the Company for more than 3 years continuously, receive a dividend of 15 per cent. of their annual wages. Those who have worked for the Company less than 3 years receive 12 per cent. of their annual wages. These dividends, the Company states, do not interfere with nor take the place of natural increases in wages.

Since 1898, the J. B. Stetson Company has been making bonus payments to certain of its employees who have been most efficient and faithful. For the past 7 years these payments have amounted to 20 per cent. of the annual earnings of these employees. The Company also gives shares of stock annually to meritorious employees.

Under the profit sharing plan of the Brooklyn-Edison Company, it distributed last year $38,000 among its employees, this amount being paid into an investment fund to the credit of the individual employees. The rate of sharing varied from 2 per cent. to 8 per cent. of the employees' yearly wages, governed by the length of service. Those of 5 years' service receive the maximum percentage, or the equivalent of the dividend on the stock of the Company.

The profit-sharing plan of the Boston Consolidated Gas Company is an admirable one. It is a singular fact that, of the number of prominent gas companies I have addressed on the subject, the Boston Com-

pany is the only one operating a profit-sharing scheme, and with them it has passed well beyond the experimental stage. I am informed that the results are quite gratifying, and I believe that other gas companies, in the interest of real co-operative effort, can well afford to adopt similar plans providing returns of equal or greater value to their employees.

Discussion.

Mr. C. M. Cohn, of Baltimore, said he was glad to note that the Association was interested in the welfare of Company employees. The three human factors in the gas industry were the investor, the consumer and the employee. The latter as a rule was the last to be taken care of by those who controlled the industry. Happily, however, there was no conflict between the factors. In fact, on his way to Denver, he came across a decision of the United States Supreme Court which had something to say as to the absence of conflict between investors and consumers. He would like to point that out to them, on the score that it was of very general interest. The decision, which related to a rate making case[1] was mentioned in that it seemed to bear on the relation of two factors involved in the industry, and that the gas industry and other industries were rapidly determining that the law of the land was a friend rather than a foe. The last Annual Report of the Consolidated Gas Company, of Baltimore, contained something of interest in this connection. Being on the Committee of the Board, and after talking with Mr. Douglas, he telegraphed to Baltimore for some data that related to the subject of pensions, and which he would like to submit for consideration. Taking 10 of the largest railroads in the country, all having pension systems, he found that about 1 per cent. of employees on the pay-roll represented the number on pension roll. In other words, for every 1,000 employees about 10 were on the pension roll, and the average amount of money paid per man per month was $24. He considered that sum very well spent, and it was due to the fact that the railroads uniformly based the allowance on 1 per cent. of the pay multiplied by years of service. They could thus easily calculate what it would mean to individual companies to keep a reserve of 1 per cent. Checking up their men to ascertain how many would be eligible to a pension at 60 or 65, they would find that 1 per cent. was about accurate. Going over his rolls and in looking over their men, on a basis of 65 years, after 15 years of continuous service, would seem to mean placing 18 on the pension roll, the whole number on the rolls being 1,876. The pension payment in round figures amounted approximately on a 1 per cent. basis, of $4,700 a year; on 1½ per cent., $7,000, and on a 2 per cent. basis about $9,500. He favored the retirement at 65 on 1½ as against retirement at 60 years on the basis of 1 per cent., in that retiring at 65 on 1 per cent. would require more money than retiring at the age of 60 at 1½. It had the advantage of giving the men more money without costing the Company any more. The granting of pensions to men would tend to not only make them more efficient during active service, but would bring the organizations of companies to greater efficiency by placing on the pension roll men who have through years of service been more or less incapacitated. They did not look upon a pension system as in any sense savoring charity. Men who had given the best years of their lives to the interests of the companies and of the public should not be allowed to suffer in their old or declining years. Certainly the public requirements of gas men generally throughout the country were becoming more and more exacting, and the companies were requiring a higher and higher standard of efficiency to meet public requirements. They all knew how much depended on the importance of men doing their work properly and courteously, often under aggravating circumstances, and of giving the public more than it was entitled to rather than less. Wherefore, those in charge of the management of companies should leave nothing undone to properly compensate the men held to such strict requirements. As to the principles underlying the pension system generally, one would find, through investigation, that these were very simple, and while Mr. Douglas' paper, of necessity, was somewhat lengthy, in order to point out several variations in vogue in the system, yet on analyses they would find any plan thought of could be easily understood and applied. He emphasized that, because he believed there was natural reluctance on the part of gas officials to take up anything of the kind that meant giving out the company's money save where direct returns could be seen. He, therefore, rather encouraged all to look into the pension systems in the light of considering the principles, not that the money paid through a pension system was a gratuity to the men. [Applause.]

Mr. H. W. Peck (Rochester, N. Y.) thought the Convention would have been incomplete without a discussion on this subject. As public service companies, they should be in the vanguard in considering economical problems. It was necessary for them to be prominent in the matter of rate making, capitalization, property valuation, etc., and they should be prominent in pensions and profit-sharing. He believed that active steps in this should be taken by companies large and small. Companies just getting along comfortably could adopt such a plan, probably on a less expensive scale than the others, to show that the industry, as a whole, was working along this line. Continuous service and increased efficiency were the two objects to be attained by these two plans of profit-sharing and pensions. Of course the two should not be confused. Mr. Douglas's compilation of methods was very valuable to those who, like themselves in Rochester, had not adopted a plan, but were strongly considering it. He was sorry that more items of cost were not included, for it was such items that must be considered in determining exact details of any plan. To certain details of the plans outlined, he would like to refer briefly. The opportunity to buy stock out of the regular wage earning was of small value in accomplishing the gaining of continued service and increased efficiency. He thought $1,500 was too low a salary to fix the ineligible, and that 5 years service was probably too short a period wherein to begin operations. It was very desirable to have returns graded, and that it was inadvisable to fix the necessary time of going out of active service at as low as 60 years. The point of the paper seemed to indicate that most of the employees did not enjoy work. He believed it better for men between 60 and 70 to remain in active service than retire on a pension, which, together with their savings, would not enable them to get along. He believed in allowing them to work as long as they could, and that the right to ratify the form of contract as suggested by several, should be considered with a great deal of care, for if the employees of any or all of their companies got an idea that in a few years they were liable to cut this down largely, they could not have the assurance that they would have if the plan were so carefully formulated that they could count on it. It was very important that any change should not be retroactive. Any agreements made should certainly be adhered to. Even though if any future ones should be modified, such modifications, if possible, should be outlined some time in advance. He believed the fixed percentage of wages was a bad plan, in that it did not tend to increase efficiency, which was one of the objects to be attained. It was simply an increase in wages. If one gave them each year, 10, 15 or 20 per cent. regardless of the conditions of the business, it did not spur them to improve their service, nor was it an economical justification of the plan. The plan should make it possible for the company to retire inefficient help as warranted without doing an injustice, for all of them had help they were keeping on because it would be unfair not to keep them. Even though possibly, due to ill health, they had not reached the age limit, it was not fair to let them go. They should have the right to give these pensions, at the same time not encumbering themselves with inefficient help. A common point of view regarding matters was to say business required capital and labor, both of which receive wages—interest or dividend was the wage of capital, the pay roll showed the wage of labor. From that point would it not be a good plan to assign a fixed value for the wages of capital, say 4, 5 or 6 per cent., any amount above that to be considered as profit due to good business management, and divide that profit above 6 per cent. between capital and labor. Thus the employees would get very direct benefit and make the operation more efficient to raise the rate of earnings above 6 per cent.--if that was the limit—and they would get direct advantage from it as well as the common stockholders. He believed that a profit-sharing plan should be so arranged that the money received by the labor should be invested for them, not simply given them as additional wages. Such was the function of this arrangement—to take care of the shortsightedness of the labor—due to inexperience and carelessness. The profit-sharing results should be invested for them in every case with the privilege of drawing out for any special purpose, such as buying a home, sickness, etc. He believed as has been said that the continued profit sharing and pension plan was the satisfactory system, remembering the two distinct reasons for it, increased efficiency and continued service. [Applause.]

Mr. Wrightington said the last two speakers thought the profit-sharing plan and pension scheme should go together. He agreed, but thought the former the more important, for which reason it was the first plan adopted in Boston. Mr. Cohn said only 1 per cent. of the employees of 10 railroads received a pension, which meant the other 99 per cent. were not taken care of in respect to any addition to their wages on increased efficiency account. Another advantage favoring profit sharing was, in the case of pensioning, they would all hate to look ahead to the time of reaching 65. Youth often thinks that time will never come, wherefore their daily efficiency is not increased much from the fact that in 25 or 30 years a pension will be their portion. He thought the best way of getting the men to the efficiency point was through profit sharing. Of course, several things were to be avoided. To begin with, it was unwise to include all the employees. In Boston they included only those who did the best work, so the employees could not consider the move as an increase in wages; it was a reward for increased efficiency. Frequently they had to drop a man from the fund, as a matter of discipline because of wrong doing. Another important thing was the provision requiring an employee not to sell his stock. Mr. Douglas said an employee had a right to sell it, and so he had, the title to it resting entirely with him; but if he sold it he might forfeit the right to any future amount of payments on account of the profit sharing. It is extremely important the men should, by retaining stock, retain an interest in the prosperity of the company, which is what they were trying to arouse. In his case, the dividends, as they are, depend upon the price of gas; by means of the sliding scale basis, means, if the employees' dividends on wages are the same as the dividends on stock, they are able by their efforts to increase the business or reduce the cost, thus reducing the price. His percentage of the profit would be correspondingly increased. As to the cost of the plan. They expended about $50,000 a year on profit sharing, which is apportioned among some 700 out of the total of 900 employees. The plan had been in force 4 or 5 years, by next year the number of men on the profit sharing plan during that time will have received about ½ their annual salary or wages thus causing them to have a substantial interest in the Company through stock membership therein. Another important adjunct recently in force on the plan is the nomination by fund members of a Director to represent them on the Board of Directors, who, sitting with the other Directors, is frequently consulted as to the effect of suggested changes on the employees. They believe the profit sharing

1. Not to hand, Dec. 9th, 1911. Eds.

plan is successful as far as tried. It improved the efficiency of the men, giving them a better feeling all around. He thought the Association could not do better than to study this very thoroughly, recommending to the home offices the adoption of some one plan. [Applause.]

Mr. Walton Forstall said that as an operating man he was glad of the opportunity to state one phase of the pension scheme mentioned by Secretary McVeagh—namely, that it would not necessarily add to the cost of operation. In Philadelphia they were a comparatively junior department, in that the start was made in 1909. At present their men were young. As those men got older, it would not do to turn them into the world, yet they knew perfectly well that their efficiency would decrease. So they were confident that, upon the pension system, they could probably save money rather than having it cost them extra. Some years ago, when investigating a certain company, he went out on the service work. He found some men not doing what could be considered ½ day's work, yet they had been with the company so long that it was unwilling to discharge them, yet the Company was not willing to do what he considered the logical thing—to put them on a pension.

Mr. J. P. Hanlan said that inasmuch as the "Welfare Plan" of a public service corporation had been touched on, he would like to dwell on it for a minute or two. This year the Public Service Corporation, of New Jersey, put a plan into effect and the paper notes that the Company gives pensions. In addition thereto the Corporation has a sick benefit arrangement, whereby an employee who does not get his wages receives a certain stipulated daily wage for a certain time, which he believed was limited to 90 days in 1 year. The Welfare Committee, however, took up special cases when such arose. They also gave pension at the age of 65 years voluntarily. At the age of 70 retirement was compulsory. Last year the State of New Jersey passed an Employers' Liability Act, and our Public Service Corporation was one of the first corporations, he said, to accept its provisions. His hearers could not appreciate the difference now amongst the men working for this Company, owing to the broad and liberal policy adopted by the Company in this matter. All had opportunity to accept or reject the provisions of the Employers' Liability Act. Personally he accepted it, because it seemed a step in the right direction. Some of the men rejected it. Speaking to one of the chaps about to reject its provisions, the speaker said: "It is strange to me that you are rejecting this act." His reply was, "I do not want to bind the Company to do something that it did voluntarily in the past." That emphasizes the spirit of the men toward the Company. They could not buy loyalty, but they could buy efficient service. The company that treated its employees right would find these employees standing by it to the last ditch. They were satisfied to hold their jobs; *vice versa*, the company that does not so treat its employees finds them at work simply to get their wages. That this Company had taken such broad stand on welfare work was bound to bring back big interest on the money so spent. The Company, he added, pays a death benefit of $300 to the beneficiaries of employees receiving less than $1,800 per year salary, and also gives 750 of them a very good luncheon every day. For all these good things they did not contribute one cent. [Applause.] He thought the National Commercial Gas Association, and the Paper Committee, were to be commended very highly for this paper. It showed advanced thought and he believed the Douglas paper which had taken a great deal of work for its preparation, certainly deserved their thanks, and he thought, as most of the members of this Association did, that they had spent a very profitable period in listening to and discussing it.

Mr. J. A. Norcross believed every company should make some provision for the old age and incapacity of its employees, but, as between the pensions and profit-sharing, he believed the latter did much more for the company and for the men than the former. In case both were adopted, and he thought they should be, profit-sharing should be given the greater prominence. A pension system, which should be tried as a last resort, seemed to him to remove the incentive to do good work, or to take away interest, for the man feels he is going to get something whether or not he earned it, if he can remain on the payroll. Profit-sharing, on the other hand, was a bird in hand instead of the bush. The man got it as he went along (in most cases in the stock of the company) and becoming a part owner in the company, he took a personal interest for that reason which he might not take for any other. In New Haven their profit-sharing plan had been in operation about 5 years. They were entirely satisfied with its effect, both from the standpoint of the Company and that of the employee. The officers were the only members of the force excluded from the terms of the plan, which was simply to credit each employee at the end of the quarter with a dividend of 8 per cent. on his wages, 8 per cent. being the dividend given the stockholder. When that credit equalled the market value of a share of stock, the Company turned over the share to the employee, which then was his property to do with as he chose. As Mr. Wrightington said danger is in that, through the temptation for many of them to dispose of their stock. They had with them many Italians, who remained long enough to become participants in the profit-sharing scheme, and then turned their stock into the market prior to going home to Italy, where they remained 2 years or so, and returned. Therefore, the plan was only applicable to those with them for a year, wherefore, when these men came back they were not immediately placed on the profit-sharing plan. In other words, it took them a year to get on this plan. He disagreed with Mr. Wrightington that the plan should not include all employees in spite of this weakness, in that these men did turn in stock for cash and spend the money. The total amount held was about 90 per cent. of that given them. In addition to the profit sharing while they did not have a recognized pension system, they treated every case as an individual one. Their practice, in the case of people who have worked for them 25 to 30 years, was to retire them on half pay as soon as they became noticeably inefficient. They also instituted what was called the "Employees' Saving Account." Employees were allowed to order the Company to take out from their wages a certain amount per week, the Company to give the employee 5 per cent. interest from the time the amount was taken out, which money was put into stock when the accumulations were large enough. Quite a large number were putting money aside week-by-week in that way. Still another way in which they tried to involve employees in personal ownership of the Company was by offering them opportunities to subscribe to new issues of securities on favorable terms. Twice they had, in issuing new securities, offered these to the employees, to be paid for on the installment plan. The Company went into the market and bought rights for the new securities, then carried the investment, took the installments, allowing interest on the latter from the time they were bought; finally, when the subscription was paid up, they turned over the stock (or balance, whatever it happened to be), to the employee. [Applause.]

A Member said that his Company had been operating a profit sharing plan since 1892. Starting in October of that year, it was continued to the present time practically under the basis started by Mr. Norcross. It was very satisfactory and was paying the Company very well.

The President asked Mr. Douglas to close the discussion.

Mr. Douglas said that as the matter had been well gone over, and as the hour was late, he did not know of anything further he could say, but to wish to express his appreciation for their indulgence in listening to the paper and the discussion on it.

Mr. Frueauff felt that a very wonderful paper had been presented them, which had been followed by an extremely interesting discussion. He thought they should not pass it up without some action. He, therefore, recommended that a plan of profit-sharing and pensions be recommended to the favorable consideration of the gas fraternity.

[Mr. Frueauff, having been asked to make this in the form of a motion, he did so. It was duly seconded and unanimously carried.]

The President here made some announcements relative to the routine of the times between sessions. Secretary Stotz followed in similar strain. A motion to adjourn to the following morning (10 o'clock) then prevailed. (To be Continued.)

Items of Interest
FROM VARIOUS LOCALITIES.

AT a special meeting of the Denver (Col.) Gas and Electric Company, Mr. H. E. Hughes (of the Company's Auditing Division) and Mr. A. E. Reynolds (Manager of the Company's tar plants), were elected to the Board of Directors, succeeding respectively, Gov. J. B. Grant, deceased; and Mr. J. F. Dostal, resigned.

AT a special meeting of the Board of Directors of the Denver Gas and Electric Company, the following minutes to the memory of the late Gov. J. B. Grant, were adopted:

"Since the last meeting of the Board of Directors of this Company, a stockholder and Member of this Board, Hon. James B. Grant, has been removed by death.

"In view of the long and faithful service rendered by him to this Company it is meet and fitting that some formal recognition thereof should be taken and entered upon the minutes of this Company. Therefore be it

"*Resolved*, That, in the death of James B. Grant, who departed this life November 1, 1911, the stockholders of this Company have lost a servant who had been intimately connected with its affairs and business as Managing Director since its inception. Governor Grant was President of the Denver Consolidated Gas Company for many years prior to 1899. Upon the consolidation at that time of the Denver Consolidated Gas Company with the Denver Consolidated Electric Company, formerly the Denver Gas and Electric Company, Governor Grant took active part, becoming a Director of the new Company. He continued as an active Director in said Company until the present year, when that Company was consolidated with the present Denver Gas and Electric Light Company, of which he became a Director and continued as such until the time of his death.

"He was always a faithful attendant at the Board meetings, and his advice and counsel were eagerly sought. He was a man of affairs, of broad and varied experience, and he seemed to almost intuitively grasp a business proposition and with nice discrimination to choose the proper course of procedure. He was, in his business relations, a leader whose advice was eagerly sought, and when he spoke there was usually an end to the matter.

"He was selected by the people of his adopted State to fill the highest position—that of Chief Executive. He administered the duties of Governor of the State of Colorado with honor to himself,

credit to his party and to the welfare and prosperity of all the people.

"Governor Grant was a most lovable and entertaining companion and friend. He was well informed and thoroughly conversant with the business, financial and political topics. His disposition was sunny and cheerful, and he had a pleasing wit and kindly humor—a good story teller, and withal, a good listener. He was what might be termed a good loser—he never burdened his friends with his troubles or worries, if any he had, but he appeared to be and was at all times master of the situation.

"In his death the Company has lost a wise and safe counselor, the members of the Board a kindly, faithful and genial friend and companion, and now, while his loss seems irreparable, we can in a measure realize what it means to his wife and sons, to whom, in their hour of bereavement, we extend the heartfelt sympathy of the Board of Directors and employees of this Company."

MR. L. D. BRIGGS, of Chicago, has been appointed Resident Manager of the Great Falls (Mont.) Gas Company.

THE residents of Dexter, Mich., held a special meeting in the local Opera House some nights ago and voted on the proposition of the Ann Arbor Gas Company to lay on a gas supply, under certain specified conditions. There were 128 voters present, all of whom voted in favor of the proposition.

PAPERS announcing the incorporation of the Woodburn, Allen County, Ind., Gas Company, have been filed by E. C. Edgerton, Otto Knoblauch, E. R. Moser, C. F. Moon and Ed. Moser. It is to manufacture and distribute gas, and it starts in with the modest capitalization of $6,500.

AT a meeting of the shareholders in the Tiverton (R. I.) Gas Company, which concern has been carrying on a precarious existence for some time, the principal topic of and for discussion was the suit entered against the Company by William S. King, of Taunton, Mass., in which a judgment ($3,000) was recently handed down by the Superior Court, of Rhode Island, for which judgment the stockholders were individually liable. After this judgment had been rendered by the Court in favor of Mr. King the plant of the Company was sold at public auction about 2 months ago, at which time and place it was declared there was no representation of the stockholders present, although the officers of the Company had been notified 6 months previous to the date of the auction. Mr. King originally built the plant and was present at the auction, at which there were several bidders. Mr. King's bid of $50 was the highest and he secured the plant at that price. The original cost of the plant was $19,000. Although Mr. King has bought the plant and is at present running it, he is handicapped by the reason that the Tiverton Gas Company has still been in existence and all communications addressed to the Tiverton Gas Company that should have been forwarded to him have been received by the officers of the Company. His reason for bringing suit was to ascertain whether or not the Company was still in existence and to secure, if possible, the balance of the stock, which was held by the several stockholders. Mr. King is in possession of some $7,500 worth of stock which has been transferred to him by several stockholders, he releasing them from all further claims on the Company. Mr. King, who was present at the meeting, stated his side of the matter. He said he did not wish to push any claim against the stockholders, and that all he asked was fair play and a chance to work the plant, as he did not consider that there was any other person as capable as he at the present time to run the same. This led to considerable heated discussion among the stockholders. There were a few who were in favor of holding on to the stock, but as the matter was threshed out the majority were in favor of turning over their certificates to Mr. King. One of the stockholders remarked in expressing his views of the subject: "We have been bitten and bitten bad, and the best thing that we can do is to get from under and settle this thing in a peaceable and satisfactory manner to all concerned." When asked how much he would take for the plant as it stood now, he refused to name any price. As the matter stands, Mr. King owns the majority of the stock, some of which he obtained at the meeting, and will run the plant under his own supervision.

"V. B. R.," writing from Worcester, Mass., under date of the 29th ult., forwards the following: "Yesterday was sightseeing day in the brisk town of Webster, and the particular thing on view was the finishing touch to the radial brick stack that was being built for the Webster and Southbridge Gas and Electric Company, by the Custodis Chimney Construction Co., of your city. This particular job was under the direction of Foreman Titmouse, and what that gentleman does not know about such construction will never be mentioned in the handbooks of either Rankine or Haswell. The stack, which is 118 feet in height, starts with a base diameter of 15 feet, with a batter to 6 feet at the top. Of course, all special brick were used in its construction, which also, of course, was done from the interior, the bucket running inside the stack, power being furnished by a donkey engine right on the spot. And here it might be said that many venturesome Websterians made the bucket trip to top of stack. On the 28th the most perilous part of the job was the closing of the apertures or notches which held the scaffold frames, as those were carried to the top. That part of the task was accomplished by means of a device called an airship by the workmen, consisting of a V-shaped staging placed across the interior of the stack, the point of the V resting against the step-irons. Perched on this medium the masons closed the apertures. The work was commenced November 7th and was virtually completed the 29th of same month. It is said that the movement at top of stack is virtually 4 inches. One accident marred the construction, which resulted in the loss of two lives, a third having been saved by the almost miraculous falling of the workman into the suspended bucket."

THE proprietors of the Gardner (Mass.) Gas, Fuel and Light Company have petitioned the Massachusetts Board of Gas and Electric Light Commissioners for the right to issue 822 additional shares of stock, to be sold at par, the proceeds to be used in paying for permanent additions, etc., to the plant.

"B. W. R.," writing from Salt Lake City, Utah., under date of the 27th ult., incloses this: "Simultaneously with the hearing in the Third District Court, on the order to show cause in the suit of the Utah Gas and Coke Company against one R. L. Harley, came the news that many of the prominent signers of the petition to have the Gas Company investigated by the City Council have notified the Company that they had signed under a misconstruction and accordingly withdraw their names from the petition. They found the conditions had been misrepresented to them, and that they do not wish to be used in a private row between the Company and those who are seeking to have it 'investigated.' The Company's suit against Harley is to enjoin him from installing any more gas 'controller' devices on the Company's meters, and to force him to remove those already installed."

RECENT advices by way of Davenport, Ia., are to the effect that Mr. George H. Priest, an expert engineer on the staff of the Stone & Webster Company, Boston, Mass., which concern recently acquired the public utilities of Keokuk, Ia., is now in Keokuk arranging for the reconstruction of the gas plant.

MR. FRANK B. FIELD, fermerly for several years Secretary and Treasurer of the Waterbury (Conn) Gas Light Company, died in the Broadway-Central Hotel, New York, the afternoon of the 1st inst. He was in his 70th year.

"BLOOD" sends this, under date of the 4th inst. He declares it came originally from the Pacific Coast. He does not explain why he forwarded it, but here it is: "Oh! Harold," said Mrs. Newlywed, "A strange man was here to-day, and he said he wished to read our gas meter."

"Well; did you let him in?"

"Mercy, no! He used such very poor grammar that I felt sure he would not read it properly!"

IT transpires that the franchise under which Albany, Ore., is to have a gas works—it was originally issued to W. H. McGoldrick—has been assigned to Leon P. Lowe, of San Francisco. The undertaking concern is capitalized in $500,000, and it will transact business under the corporate title, "Albany Gas Company." The maximum rate that may be charged per 1,000 is $1.50. A further agreement specifies that the following royalty payments on output account (gross) are to rule: First year, ½ per cent.; second year, 1 per cent.; third year, 1½ per cent.; fourth year, 2 per cent.; every other year, during the life (50 years) of the franchise 2½ per cent.

THE rate agreed on for artificial gas in Elwood, Ind., is 90 cents per 1,000, net. Gas will be turned into the mains next Friday.

THE speaker of the evening on the occasion of the December meeting of the Mission Promotion Association, a suburban district of San Francisco, was Mr. John A. Britton, President of the San Francisco Gas and Electric Company. Mr. Britton's subject was "Gas and Electric Extension in the Mission District,' and it may be taken for granted that the Missioners were speedily convinced that gas was a necessity, and that the San Francisco Gas and Electric Company was the corporation best fitted to supply the gaseous needs of the Mission district.

MR. H. W. WALLACE, President of the Temple (Tex.) Gas Light Company, has returned to his home in Detroit, Mich., after a prolonged stay in Temple. During his sojourn in Temple, contracts for the necessary piping were awarded, and the work under them was started. A contract for the buildings proper was also awarded to Mr. D. A. Alexander.

THE Pine Bluff Corporation, of Pine Bluff (Ark.), which has been operating the artificial gas plant in that city, has disposed of its distribution system, the Pine Bluff Natural Gas Company being the purchaser. Natural gas was turned into the mains, Saturday, the 25th ult.

THE Stark Electric Railway Company, of Alliance, O., has placed an order with the Westinghouse Electric and Manufacturing Company for 3 quadruple equipments of No. 304-A meters, using the type L-Unit switch control.

The Market for Gas Securities.

There was no market for Consolidated gas last week, and prices for it seemed to have dropped on and through the principle of "gravity" attraction. Casting around for a reason to account for the weakness, the only real moving factor during the week was the sentencing of the McNamara brothers. How that could affect the value of metropolitan gas shares is certainly mysterious; but Wall street is particularly mysterious these days. At all events, the quotations should have increased rather than decreased in the week, if for no other reason than that the Supreme Court Commissioners, in the matter of compensation for easements respecting the Company's new terminals (2 in number), between Astoria and the Bronx, have determined that a total of $4,500 would be about right.

Brooklyn Union holds fairly well, and the like may be said on the average regarding out-of-town gas securities, although Peoples, of Chicago, fell off 2 points or so in connection with developments over the legal status of the gas rate contest.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

DECEMBER 11.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	137¾	138¼
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	2,000,000	1,000	103	105
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	105	106
Mutual Gas Co.	3,500,000	100	155	165
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	100	101½
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	35	50
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	98½	100½
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	95	100
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	94	100
Standard	5,000,000	100	60	70
Preferred	5,000,000	100	90	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	103	105
The Brooklyn Union	15,000,000	1,000	140	144
1st Con. 5's, due 1948, M. & N.	15,000,000	—	105½	107
Yonkers	299,550	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	½	¾
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	500,000	1,000	97	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	59	60
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed Gold Bonds	7,660,000	1,000	104	106¼
Cincinnati Gas and Electric Co.	29,500,000	100	87	90
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. & Heating Co.	1,682,750	100	90¼	91
Preferred	3,026,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	13,460,084		—	—
Mortgages, 5's	3,400,000		—	—
General Mortgage 4½	10,661,000		—	—
Con. Gas Co., Baltimore City, 4½	2,751,000		—	—
Consolidated Gas Co. of N. J.	1,000,000	100	15	—
Con. Mtg. 5's	976,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	3,500,000	—	102	105
Detroit City Gas Co.	6,580,000	—	—	50
" Prior Lien 5's	5,619,000	1,000	97	100½
Detroit Gas Co., 5's	881,000	1,000	75	80
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	135	138
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co., 1st Mtg. 5's	1,250,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	130	132
" Bonds, 5's	10,500,000	—	104	106
Indianapolis	2,000,000	—	—	38
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	88	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede Gas Co., St. Louis.	10,000,000	100	103	103½
Preferred	2,500,000	100	114	120
Bonds	10,000,000	1,000	102½	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,370,000	50	143	145
Madison Gas and Electric Co.				
" 1st Mtg. 6's	400,000	1,000	106	108½
Massachusetts Gas Companies, of Boston	25,000,000	100	90¼	90½
Preferred	25,000,000	100	95	95½
Montreal Gas Co., Canada	2,000,000	100	218	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	97	98
Bonds, 6's	6,000,000	—	127	128
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	103	104
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¾	105½
San Francisco Gas Co., Cal.	15,500,000	—	—	—
St. Joseph Gas Co.—				
1st Mtg. 5's	1,000,000	1,000	94	98
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	105
Extension, 6's	600,000	1,000	112¾	115
General Mortgage, 5's	3,447,000	1,000	94	96
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	101	103
Washington (D. C.) Gas Co.	1,600,000	200	439	440
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	289	—

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, October, ——, 1912. Atlantic City, N. J. Officers: President, Ira C. Copley, Aurora, Ills. Secretary, Geo. G. Ramsdell, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting, ———— Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, New York City, Oct. 1912. Officers: President, R. M. Searle, Rochester, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street. New York City.

Gulld of Gas Managers of New England.—Annual meeting, March, 1912. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, time, March, 1912, Chicago, Ills. Officers: President, C. B. Strohn, Elgin, Ills.; Secretary-Treasurer, F. E. Newberry, Dixon, Ills.

Illuminating Engineering Society.—Annual meeting, Sept. ————1912, ———— Meetings of Sections, monthly. Pres't, A. E. Kennelly, Boston, Mass.; Secretary, Preston S. Millar, 29 W. 39th street, N. Y. City. Sections: New York, Secretary, Albert J. Marshall, 16 East 40th street. New England, Secretary, H. C. Jones, 10 High street, Boston, Mass. Philadelphia, Secretary, L. B. Eichengreen, Broad and Arch streets. Chicago, Secretary, A. L. Eustice, 105 North Wabash avenue.

Indiana Gas Association.—Annual meeting, Jan. 17 and 18, 1912, Indianapolis. Officers: President, S. E. Mulholland, Fort Wayne; Vice-President, Howard L. Olds, Indianapolis; Secretary-Treasurer, Philmer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, time, May, ——, 1912; Lincoln, Neb. Officers: President, G. W. Clabaugh, Omaha, Neb.; Secretary and Treasurer, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, time, Sept. 1912. Manhattan, Kas. Officers: President, B. F. Eyer, Manhattan, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association.—Annual meeting, time, Sept. ————1912;———— Officers: President, F. W. Blowers, Kalamazoo, Mich; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April, 1912; St. Louis, Mo. Officers: President, F. E. Murray, Louisiana, Mo.; Secretary and Treasurer, N. J. Cunningham, Springfield, Mo.

National Commercial Gas Association.—Annual meeting, December, 1912. Atlanta, Ga. Officers: President, C. L. Holman, St. Louis, Mo.; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, May, 1912, Kansas City, Mo.; Officers: President, A. B. Macbeth, Independence, Kas. Secretary, T. C. Jones, Delaware, O.

New England Gas Association.—Annual meeting, third Wednesday in February, 1912 Boston. Officers: President, J. A. Coffin, Gloucester, Mass.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

New Jersey State Gas Association.—President, William H. Pettes, Newark, N. J.; Secretary-Treasurer, Arthur H. Osborn, Belmar, N. J.

Ohio Gas Association.—Annual meeting, February 6 and 7, 1912, Columbus, O.; President, John M. Garard, Columbus, O.; Secretary-Treasurer, T. C. Jones, Delaware, O.

Oklahoma Gas, Electric and Railway Association.—President, Noel R. Gascho, Alva Okla.; Secretary, H. V. Bozell, Norman, Okla.

Pacific Coast Gas Association.—Annual meeting, Sept. ————1912, ———— Officers: President, W. Baurhyte, Los Angeles, Cal.; Vice-President, Henry E. Adams, Stockton, Cal.; Secretary-Treasurer, John A. Britton, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, April, 1912, Williamsport, Pa. Officers, President, C. W. Butterworth, Milton, Pa; Secretary-Treasurer, William H. Merritt, Lebanon, Pa.

Society of Gas Lighting.—Annual meeting, December, 1911; monthly meeting, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 254 West 39th street, New York city.

Southern Gas Association.—Annual meeting, April, 1912, Jacksonville, Fla. Officers, President, H. B. Hoyt, Jacksonville, Fla.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. April 27, 28, 29, 1912; Houston, Tex. Officers: President, J. E. Carroll, Beaumont, Tex.; Secretary, D. G. Fisher, Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May 15 and 16, 1912, Milwaukee, Wis. Officers: President, H. M. Buck, Waukesha, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.